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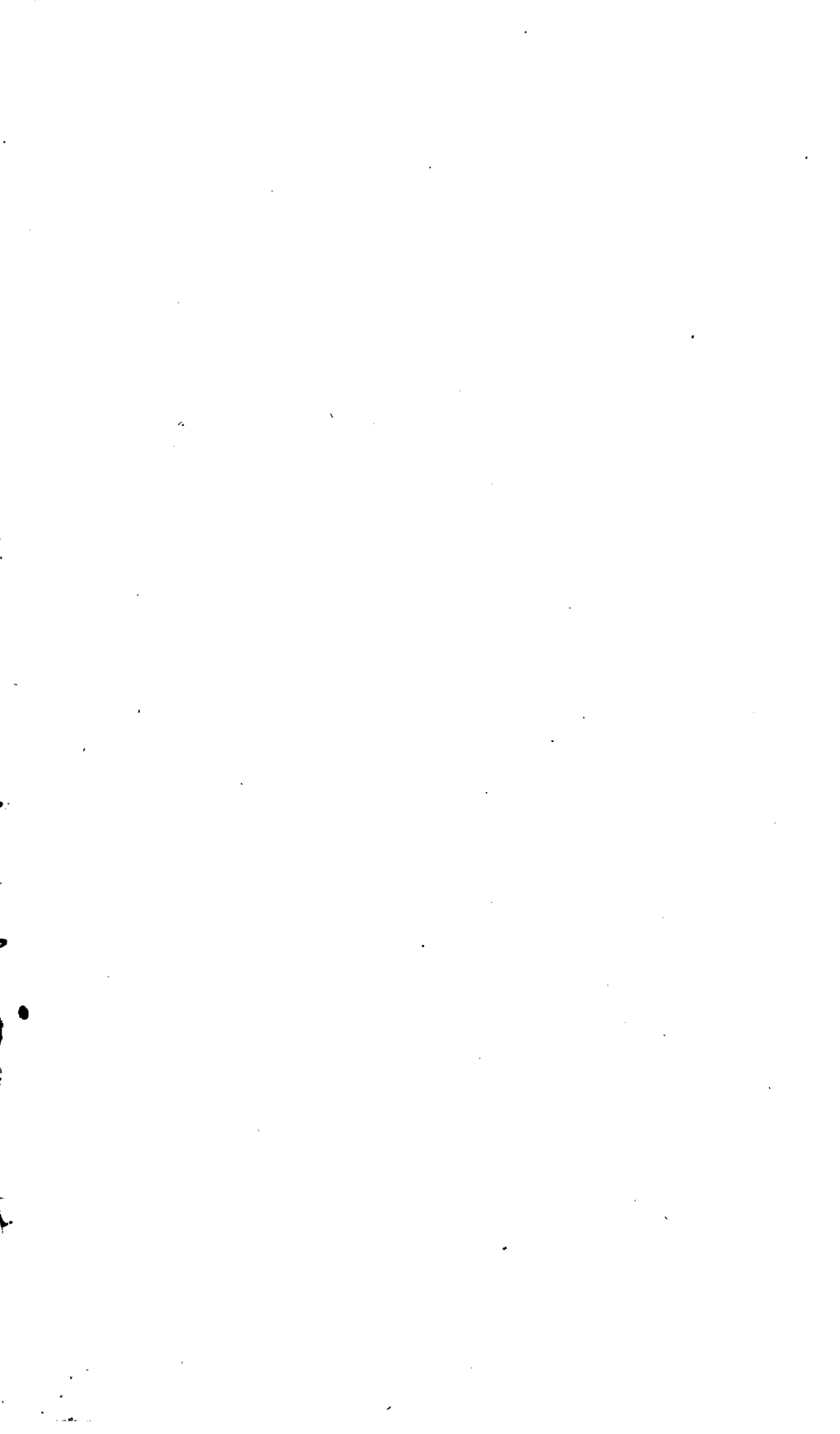


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KEY

TO

LEONARD'S ARITHMETIC.

FOR TEACHERS ONLY.

BY GEORGE LEONARD, JR.

BOSTON;

OTIS, BROADERS, AND COMPANY.

NEW YORK, ROBINSON, PRATT, & CO., AND COLLINS, BROTHER, & CO.;

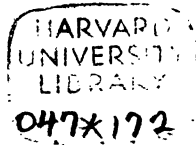
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PREFACE.

THE following Key to Leonard's Arithmetic has been prepared for those teachers, who desire to have a proper method for the solution of each example at hand, at all times, for inspection. The sale of the Arithmetic has become large, and a Key has been repeatedly and urgently called for ; not from any uncommon abstruseness in the subjects and examples, but from a wish to become acquainted with the minutest steps of each process, approved by the Author. Especially in those subjects where much of the matter bears but a distant resemblance to that found in other books on similar topics. The Mechanical Powers, Specific Gravity, Gauging, Insurance, General Average, Discount, Equation of Payments, Mensuration, &c., are articles of this kind. Indeed, a considerable part of the Arithmetic differs materially from any other ; for the subjects which relate to business, are adapted to business as it is now done, and a large portion of the examples are such as really occur in actual life. Whereas, in other arithmetics the examples, as well as the rules, are nearly all compiled from old books ; so that a person who has studied one, has, in a measure, studied all, since they are all derived from the same sources. Who can possibly derive any idea of the operations required in practical affairs, at the present time, from the study of such antiquated rules and questions ; many of which were imaginary in their origin ?

A Key is doubtless more requisite for this book than for others, in which the teacher has merely to pursue the old beaten road. It is not pretended, however, that the manner of

working pursued here is in every case, the best that can be imagined, or gives the result with the smallest number of figures. But I have endeavoured to calculate by good methods ; methods which conform to the rules ; which are fitted for the transaction of business ; which can be understood, and by which the answer is obtained by means of a moderate number of figures. It should be kept in mind, that a course which in one example yields the answer with little labor, may be very tedious when applied to other questions, even if they are similar, and under the same rule. In fact, the trouble of finding such a course may be greater than the labor required in working with a larger number of figures by a more obvious method. Besides, we are liable to mistakes of various kinds, when much of the process is performed in the mind, or when one operation is made to cancel another. Many of the regular steps being then obliterated, the work cannot be fully understood by others, or even by ourselves.

The scholar should not be required to proceed in each sum in the same manner that is pursued here ; it is sufficient if he obtains the true answer by a correct method, though it be more difficult than the one in the Key. Should his course be quite long and tedious, it may then, indeed, be well to require him to seek a more ready method, and perhaps lead him to one by appropriate questions. But in no case should he be told fully and precisely in what manner he should perform an example. Questions that will induce him to think, and lead him, by his own reasoning to short and simple solutions, are proper, but positive directions should rarely be given.

Speaking of the impolicy of telling a scholar every step to be taken, reminds me of the propriety of saying a few words concerning the great number of rules and precepts to be found in many arithmetics. In these books every subject contains at least one rule, although the examples may involve the same principles as those under a general rule, by which they may be solved.

Now what does a scholar learn when there is such a multitude of rules. He merely learns to decipher the meaning of each one, and to take every step required by it in working the examples which

follow ; nothing more. When there is a rule for every thing, the reasoning faculties of the learner, so far as any useful exercise is concerned, are left at rest ; the author thinks for him, and really solves the examples for him ; he has nothing to do but go through the operations pointed out in the rules.

The scholar cannot remember these rules for any length of time. He cannot carry his arithmetic about in his pocket, to consult, in every question that arises in business. He is not exercised in applying common sense to discover the arithmetical operations proper to employ in each case. In fact, he is not taught to refer all ordinary calculations to a few simple, easily remembered principles ; the only course which can be of use to him in after life.

Persons who have pursued arithmetic in this way, hardly ever attempt to work in practice as they have been taught. They forget most of the immense mass of rules in a few months after leaving school ; and the questions that occur in business, they solve by common sense ; as well as a lack of all previous exercise in such a course will admit.

Another error, quite opposite the one I am now censuring, consists in dispensing with rules almost entirely. This course is not so injurious to the mind as the other ; but it is very tedious to refer back to first principles in all cases. The teacher, who has constant exercise, may be able to do so with sufficient facility. The apt scholar may also be ready enough while he is constantly engaged in this study, but in practical life he soon loses this facility, and forgets the half-perceived principles which have influenced him in many calculations. Indefinite ideas, or ideas that we have not learned to express or generalize in a sentence, soon pass from the mind.

From the preceding considerations it is obvious, that there should be but a moderate number of general rules ; the truth and propriety of which the scholar can be readily taught to understand and appreciate. These few rules can be remembered, and they serve as resting points to the mind. A person, by investigating each example in his book, and discovering the principles involved,

and the rules which apply, soon acquires an aptitude in this exercise; with an acuteness of perception that will enable him to overcome any difficulty that may arise in the many novel cases that constantly occur.

Another point in the Arithmetic connected with the Key, is worthy of discussion. Some teachers are anxious, that the answers should appear in the Key only, and should not be given in the Arithmetic, while a great majority prefer to have them constantly before the learner. There are, undoubtedly, both advantages and disadvantages in having the answers given. The greatest and almost only objection to answers in the Arithmetic, arises from the student's abuse of the information. In Addition, Subtraction, Division, Decimal Fractions, and in a few questions in some other subjects, the scholar can employ the answer to relieve him of much of his labor, unless he is counteracted. This difficulty can be obviated, in these rules, by having many examples worked on the black-board during recitation. Also, by occasionally requiring the class to close their books, and giving out questions to be solved on the slates. The last course excites each scholar's emulation to exceed his fellows in correctness and despatch. It should frequently be resorted to on this account alone.

In most of the rules the answers furnish no hint of the method of solution, and are rather beneficial than injurious, especially when extensive use is made of the black-board.

In conclusion, it may be well to observe, that this Key, being intended for teachers only, is published in a peculiar manner, in order to keep it out of the scholar's hands. It can be obtained only by a teacher, who applies personally to the publishers, or who sends them a *written* order by some bookseller or other person with whom they are acquainted.

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ADDITION.

Lesson 13.

(2)	(3)	(4)	(5)
100	3	23	30112
201	2	12	23010
322	3	113	14234
<u>1265</u>	<u>1</u>	<u> </u>	<u>2322</u>
Ans. 1,888	Ans. 9	Ans. 148	Ans. 69,678 dollars.

Lesson 14.

(2)	(3)	(4)	(5)
8	37276	975	75
9	9536	483	57
15	45092	237	88
<u>7</u>	<u>8870</u>	<u>87</u>	<u>10</u>
Ans. 39	Ans. 100,774	Ans. 689	Ans. 230 dollars.
Ans. 2,471 dollars.			

Lesson 15.

(1)	(2)	(3)
456321783	576377	88745
283683001	6892203	3431
477054212	7203578	48032
336864326	4349	23324
<u> </u>	<u>643481</u>	<u>73782</u>
Ans. 1,553,923,322	Ans. 15,319,988	Ans. 237,314

Lesson 16.

(1)	(2)	(3)	(4)
858	230007321	5	1000
375	562077899	37	5675
9	125766232	463	8340
4507	440488552	5398	12345
23	234711143	93424	<u> </u>
<u>1</u>	<u> </u>	<u>643779</u>	Ans. 27,360 dol-
456	Ans. 1,593,051,147	29944	lars.
678	<u> </u>	<u> </u>	
Ans. 6,907		Ans. 773,050	

ADDITION.

(5)	(7)	(8)	(9)
45	34	3575412	15255
18	28	900	9237
156	27	8	12676
225	32	27	275
9	42	8208	
—	29	450275	Ans. 37,443
Ans. 453	33	633	[dollars.
	35	44	
(6)	30	65000	(10)
1706	—	1225	165200
84	Ans. 290 bushels.	—	47695
—		Ans. 4,101,732	8279
Ans. in 1790			3545
			Ans. 224,719
			[bushels.

Lesson 17.

(1)	(2)	(3)	(4)	(5)
135	27	399462	85	2327
75	21	269533	37	637
27	—	280679	6	—
96	Ans. 48 years.	610014	5	Ans. 2,964 dollars.
65		97210	275	
—		297211	—	
Ans. 398 dollars.		—	Ans. 408 dollars.	
		Ans. 1,954,109		
(6)	(7)	(8)		
25	7	6236		
58	87455383	614		
12	67914533	869		
75	29	325		
—	456½	—		
Ans. 170 cents.	500000	Ans. 8,044 dollars.		
	—			
	Ans. 155,870,408			

(9)	(10)
2756	115
1000	42
75	186
467	145
395	16
5832	24
—	—
Ans. 10,525 dollars.	Ans. 528 miles.

SUBTRACTION.

Lesson 23.

(2)	(3)	(4)	(5)	(6)
96	688	45647	8946	1507.
45	133	21546	805	1103
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Ans. 51	Ans. 555	Ans. 24,101 feet.	Ans. 8,141 dollars.	Ans. 404 [bushels.]

Lesson 24.

(2)	(3)	(4)	(5)
636	35	8005	112305
457	9	5126	81307
<hr/>	<hr/>	<hr/>	<hr/>
Ans. 179	Ans. 26	Ans. 2,879 dollars.	Ans. 30,998 dollars.

Lesson 25.

(2)	(3)	(4)	(5)
60025	324573819746	510002	174833
46	147233518869	120005	52003
<hr/>	<hr/>	<hr/>	<hr/>
Ans. 59,979	Ans. 177,340,300,877	Ans. 389,997	122,830 Ans.]

Lesson 26.

(1)	(2)	(3)
64321535488327	9000052	750081
10035780321199	1643215	3011
<hr/>	<hr/>	<hr/>
Ans. 54,285,755,167,128	Ans. 7,356,837	Ans. 747,070

(4)	(5)	(6)	(7)
81	1799	11375	48323
33	67	3287	19295
<hr/>	<hr/>	<hr/>	<hr/>
Ans. 48	Ans. in 1732	Ans. 8,088 dollars.	Ans. 29,028 dollars.

(8)	(9)	(10)
43000	275	23
25376	125	16
<hr/>	<hr/>	<hr/>
Ans. 17,624	Ans. 150 bushels; cost 202 dollars.	39
		23
		39
		23
		<hr/>
		Ans. 16

MULTIPLICATION.

Lesson 27.

(1)	(2)	(3)	(5)
1210	75	103	2750
3145	39	27	1385
<u>4355</u>	<u>5635</u>	<u>4135</u>	<u>275</u>
	4355		323
	Ans. 36 feet.	Ans. 76 dollars.	598
Ans. 1280			4135
			598

Ans. 3,537 dollars.

(6)	(7)	(8)
32052465	2332	15235
22297621	1421	12250
<u>Ans. 9,754,844</u>	<u>Ans. 911 miles.</u>	<u>Ans. 2,985 dollars.</u>
(9)	(10)	
235	2000	
147	9	
<u>Ans. 88 dollars.</u>	<u>Ans. 1,991 bushels.</u>	

MULTIPLICATION.

Lesson 33.

(2)	(3)	(4)	(5)
15	196	5280	185000000
2	9	3	4
<u>Ans. 30</u>	<u>Ans. 1,764 pounds.</u>	<u>15840</u>	<u>Ans. 740,000,000</u>
		6	
		Ans. 95,040	

Lesson 34.

(2)	(3)	(4)	(5)
134	2327	345	1235
25	14	94	112
<u>670</u>	<u>9308</u>	<u>1380</u>	<u>2470</u>
268	2327	3105	1235
<u>Ans. 3,350</u>	<u>Ans. 32,578</u>	<u>Ans. 32,430</u>	<u>Ans. 138,320 dollars.</u>
[dollars.]	[dollars.]		

Lesson 35.

(2)	(3)	(4)
6357	4821	43002
2335	1131	25
-----	-----	-----
31785	4821	215010
19071	14463	86004
19071	4821	-----
12714	4821	Ans. 1,075,050
-----	-----	
Ans. 14,843,595	Ans. 5,452,551	

Lesson 36.

(1)	(2)	(3)
254420335	815555	5001
3347889	5542	357
-----	-----	-----
2289783015	1631110	35007
2035362680	3262220	25005
2035362680	4077775	15003
1780942345	4077775	-----
1017681340		Ans. 1,785,357
763261005	Ans. 4,519,805,810	
763261005		

Ans. 851,771,040,922,815		

(4)	(5)	(6)	(7)
234	5237	421	646325
19	8	42	5335
-----	-----	-----	-----
2106	Ans. 41,896 dollars.	842	3231625
234		1684	1938975
-----		-----	1938975
Ans. 4,446 dollars.		Ans. 17,682	3231625

			Ans. 3,448,143,875

(8)	(9)	(10)
35	25	832
5	12	13
-----	-----	-----
Ans. 175 dollars.	50	2496
	25	832
	-----	-----
	Ans. 300 dollars.	Ans. 10,816

MULTIPLICATION.

Lesson 37.

$$\begin{array}{r} (1) \\ 12212 \\ 375 \\ \hline 61060 \\ 85484 \\ 36636 \\ \hline \end{array}$$

Ans. 4,579,500

$$\begin{array}{r} (2) \\ 313 \\ 225 \\ \hline 1565 \\ 626 \\ 626 \\ \hline \end{array}$$

Ans. 70,425 days.

$$\begin{array}{r} (3) \\ 8231 \\ 26 \\ \hline 49386 \\ 16462 \\ \hline \end{array}$$

Ans. 214,006 dollars.

$$\begin{array}{r} (4) \\ 473 \\ 116 \\ \hline 2838 \\ 473 \\ 473 \\ \hline \end{array}$$

Ans. 54,868 dollars.

$$\begin{array}{r} (5) \\ 303 \\ 12 \\ \hline 606 \\ 303 \\ \hline \end{array}$$

Ans. 3,636 dollars.

$$\begin{array}{r} (6) \\ 351 \\ 41 \\ \hline 351 \\ 1404 \\ \hline \end{array}$$

Ans. 14,391 times.

$$\begin{array}{r} (7) \\ 18 \\ 9 \\ \hline \end{array}$$

Ans. 162 dollars.

$$\begin{array}{r} (8) \\ 15 \\ 12 \\ \hline \end{array}$$

30
15

Ans. 180 miles.

$$\begin{array}{r} (9) \\ 459 \\ 3 \\ \hline \end{array}$$

Ans. 1,377 dollars.

$$\begin{array}{r} (10) \\ 189 \\ 13 \\ \hline \end{array}$$

567
189

Ans. 2,457 dollars.

Lesson 38.

$$\begin{array}{r} (2) \\ 35 \\ 4 \\ \hline 140 \\ 3 \\ \hline 420 \\ 52 \\ \hline 840 \\ 2100 \\ \hline \end{array}$$

Ans. 21,840 dollars.

$$\begin{array}{r} (3) \\ 236 \\ 11 \\ \hline 236 \\ 236 \\ 2596 \\ 27 \\ \hline 18172 \\ 5192 \\ 70092 \\ 19 \\ \hline 630828 \\ 70092 \\ \hline 1331748 \\ 7 \\ \hline \end{array}$$

Ans. 9,322,236

$$\begin{array}{r} (4) \\ 5321 \\ 424 \\ \hline 21284 \\ 10642 \\ 21284 \\ \hline 2256104 \\ 33 \\ \hline 6768312 \\ 6768312 \\ \hline \end{array}$$

Ans. 74,451,432

$$\begin{array}{r} (5) \\ 12 \\ 10 \\ \hline 120 \\ 3 \\ \hline \end{array}$$

Ans. 360 bushels.

$$\begin{array}{r} (6) \\ 24 \\ 9 \\ \hline 216 \\ 7 \\ \hline \end{array}$$

Ans. 1,512 miles.

$$\begin{array}{r} (7) \\ 25 \\ 9 \\ \hline 225 \\ 8 \\ \hline 1800 \\ 7 \\ \hline 12600 \\ 6 \\ \hline 75600 \\ 5 \\ \hline \end{array}$$

Ans. 378,000

Lesson 39.

$$\begin{array}{r} (2) \\ 245181 \\ 6005 \\ \hline 1225905 \\ 1471086 \\ \hline \end{array}$$

Ans. 1,472,311,905

$$\begin{array}{r} (3) \\ 1296 \\ 206 \\ \hline 7776 \\ 2592 \\ \hline \end{array}$$

Ans. 266,976

$$\begin{array}{r} (4) \\ 3837 \\ 2108 \\ \hline 30696 \\ 3837 \\ 7674 \\ \hline \end{array}$$

Ans. 8,088,396

$$\begin{array}{r} (5) \\ \text{Ans. 250 dollars.} \end{array}$$

$$\begin{array}{r} (6) \\ \text{Ans. 400 dollars.} \end{array}$$

$$\begin{array}{r} (7) \\ \text{Ans. 165,000 dollars.} \end{array}$$

$$\begin{array}{r} (8) \\ \text{Ans. 45,000} \end{array}$$

$$\begin{array}{r} (9) \\ \text{Ans. 300} \end{array}$$

$$\begin{array}{r} (10) \\ \text{Ans. 255,000} \end{array}$$

Lesson 40.

$$\begin{array}{r} (4) \\ 65 \\ 200 \\ \hline \end{array}$$

Ans. 13,000 pounds.

$$\begin{array}{r} (5) \\ 432000 \\ 2100 \\ \hline 432 \\ 864 \\ \hline \end{array}$$

Ans. 907,200,000

$$\begin{array}{r} (6) \\ 160 \\ 20 \\ \hline \end{array}$$

Ans. 3,200 dollars.

$$\begin{array}{r} (7) \\ 2000 \\ 6 \\ \hline \end{array}$$

12,000 dol-
[lars.

$$\begin{array}{r} (8) \\ 250 \\ 80 \\ \hline \end{array}$$

Ans. 20,000 dol-
[lars.

$$\begin{array}{r} (9) \\ 83500 \\ 977 \\ \hline 5845 \\ 7515 \\ \hline \end{array}$$

Ans. 81,579,500

$$\begin{array}{r} (10) \\ 20 \\ 9 \\ \hline \end{array}$$

Ans. 180 dol-
[lars.

DIVISION.

Lesson 46.

(2) 3)126	(3) 2)264	(4) 5)1230	(5) 8)688
Ans. 42	Ans. 132 dollars.	Ans. 246 dollars.	Ans. 86 dollars.

(6) 9)64459 — 1 dollar over.	(7) 4)216	(8) 6)1305 — 3 over.
Ans. 7,162 barrels.	Ans. 54	Ans. 217 in a flock.

Lesson 47.

(2) 12)108(9 cents Ans. 108	(3) 25)1043(41 times Ans. 100 43 25 — 18 over.	(4) 26)1638(63 months Ans. 156 78 78
-----------------------------------	--	--

(5) 112)1344(12 dollars Ans. 112 — 224 224

(6) 73)6205(85 Ans. 584 — 365 365
--

(7) 87)35757(411 pounds Ans. 348 — 95 87 — 87 87
--

(8) 34)412(12 to each Ans. 34 — 72 68 — 4 over.
--

Lesson 48.

<p>(2)</p> <p>1021) 457408 (448</p> <p>4084 [Ans.</p> <hr/> <p>4900</p> <p>4084</p> <hr/> <p>8168</p> <p>8168</p> <hr/>	<p>(3)</p> <p>21) 10985 (523</p> <p>105 [Ans.</p> <hr/> <p>48</p> <p>42</p> <hr/> <p>65</p> <p>63</p> <hr/> <p>2 over.</p>	<p>(4)</p> <p>32) 3584 (112</p> <p>32 [Ans.</p> <hr/> <p>38</p> <p>32</p> <hr/> <p>64</p> <p>64</p> <hr/> <p>Ans. 111</p>
---	--	---

(5)

8) 895 — 7 over.

Lesson 49.

<p>(1)</p> <p>7) 3647819</p> <hr/> <p>Ans. 521,117</p>	<p>(2)</p> <p>3975) 46200981 (11,622 Ans.</p> <p>3975</p> <hr/> <p>6450</p> <p>3975</p> <hr/> <p>24759</p> <p>23850</p> <hr/> <p>9098</p> <p>7950</p> <hr/> <p>11481</p> <p>7950</p> <hr/> <p>3,531 over.</p>
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<p>(3)</p> <p>1894) 115692192 (61,083 Ans.</p> <p>11364</p> <hr/> <p>2052</p> <p>1894</p> <hr/> <p>15819</p> <p>15152</p> <hr/> <p>6672</p> <p>5682</p> <hr/> <p>990 over.</p>	<p>(4)</p> <p>6) 22302</p> <hr/> <p>Ans. 3,717 dollars.</p>	<p>(5)</p> <p>365) 96666 (264 dollars a day</p> <p>730 [Ans.</p> <hr/> <p>2366</p> <p>2190</p> <hr/> <p>1766</p> <p>1460</p> <hr/> <p>306 over.</p>	<p>(6)</p> <p>17) 1368 (8 Ans.</p> <p>136</p> <hr/>	<p>(7)</p> <p>6) 750</p> <hr/> <p>Ans. 125 dollars.</p>
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DIVISION.

$$\begin{array}{r} \text{(8)} \\ 75 \overline{) 975} \text{(13 Ans.} \\ \underline{75} \end{array}$$

$$\begin{array}{r} 225 \\ 225 \end{array}$$

$$\begin{array}{r} \text{(9)} \\ 45 \overline{) 5310} \text{(118 Ans.} \\ \underline{45} \end{array}$$

$$\begin{array}{r} 81 \\ 45 \end{array}$$

$$\begin{array}{r} 360 \\ 360 \end{array}$$

$$\begin{array}{r} \text{(10)} \\ 434 \overline{) 3472} \text{(8 Ans.} \\ \underline{3472} \end{array}$$

Lesson 50.

$$\begin{array}{r} \text{(1)} \\ 25 \overline{) 28400} \text{(1,136 dollars} \\ \underline{25} \end{array}$$

[Ans.

$$\begin{array}{r} 34 \\ 25 \end{array}$$

$$\begin{array}{r} 90 \\ 75 \\ \underline{150} \\ 150 \end{array}$$

$$\begin{array}{r} \text{(2)} \\ 4 \overline{) 108} \end{array}$$

Ans. 27

$$\begin{array}{r} \text{(4)} \\ 25 \overline{) 625} \text{(25 pounds Ans.} \\ \underline{50} \end{array}$$

$$\begin{array}{r} 125 \\ 125 \end{array}$$

$$\begin{array}{r} \text{(3)} \\ 44 \overline{) 528} \text{(12 cents Ans.} \\ \underline{44} \end{array}$$

$$\begin{array}{r} 88 \\ 88 \end{array}$$

$$\begin{array}{r} \text{(5)} \\ 15 \overline{) 225} \text{(15 Ans.} \\ \underline{15} \end{array}$$

$$\begin{array}{r} 75 \\ 75 \end{array}$$

$$\begin{array}{r} \text{(6)} \\ 37 \overline{) 57202} \text{(1,546 days} \\ \underline{37} \end{array}$$

[Ans.

$$\begin{array}{r} 202 \\ 185 \end{array}$$

$$\begin{array}{r} 170 \\ 148 \end{array}$$

$$\begin{array}{r} 222 \\ 222 \end{array}$$

$$\begin{array}{r} \text{(7)} \\ 6665 \overline{) 6665} \end{array}$$

6665

$$\begin{array}{r} \text{(8)} \\ 7 \overline{) 28791} \end{array}$$

Ans. 4,113

$$\begin{array}{r} \text{(9)} \\ 40 \overline{) 364920} \text{(9,123 Ans.} \\ \underline{360} \end{array}$$

$$\begin{array}{r} 49 \\ 40 \end{array}$$

$$\begin{array}{r} 92 \\ 80 \end{array}$$

$$\begin{array}{r} 120 \\ 120 \end{array}$$

$$\begin{array}{r} \text{(10)} \\ 9 \overline{) 873} \end{array}$$

Ans. 97 miles.

Lesson 51.

$$\begin{array}{r} \text{(3)} \\ 7 \overline{) 105} \\ \underline{7} \end{array}$$

Ans. 15

$$\begin{array}{r} \text{(4)} \\ 65 \overline{) 1625} \text{(25 Ans.} \\ \underline{130} \end{array}$$

$$\begin{array}{r} 325 \\ 325 \end{array}$$

$$\begin{array}{r} \text{(5)} \\ 7 \overline{) 168} \text{(24 Ans.} \\ \underline{4} \end{array}$$

$$\begin{array}{r} 28 \\ 3 \end{array}$$

$$\begin{array}{r} 84 \end{array}$$

2 horses.

$$\begin{array}{r} 168 \end{array}$$

(6)

$$\begin{array}{r} 13 \\ 8 \\ \hline \end{array}$$

104

11

$$\begin{array}{r} 104 \\ \hline \end{array}$$

104

1144

3

$$\begin{array}{r} 3432 \\ \hline \end{array} 17160 \text{ (5 Ans. } 17160 \text{)}$$

(7)

$$\begin{array}{r} 95 \\ 16 \\ \hline \end{array}$$

570

95

$$\begin{array}{r} 1520 \\ \hline \end{array} 85120 \text{ (56 pounds Ans. } 7600 \text{)}$$

9120

9120

Lesson 52.

(2)

$$\begin{array}{r} 23 \\ \hline \end{array} 2300 \text{ (100 dollars [Ans. } 23 \text{])}$$

00

(3)

$$\begin{array}{r} 41 \\ \hline \end{array} 42230 \text{ (1,030 Ans. } 41 \text{)}$$

123

123

0

(4)

$$\begin{array}{r} 85 \\ \hline \end{array} 89760 \text{ (5,280 Ans. } 85 \text{)}$$

47

34

136

136

0

(5)

$$\begin{array}{r} 27 \\ \hline \end{array} 27054 \text{ (1,002 Ans. } 27 \text{)}$$

054

54

(7)

Ans. 530|00

(8)

Ans. 2|311 over.

(9)

Ans. 5998|43 over.

(10)

Ans. 1522|0

(11)

Ans. 372|000

(12)

Ans. 2|1300 over.

Lesson 53.

(2)

$$\begin{array}{r} 6 \\ \hline \end{array} 00)122|00 \text{ — 200 over.}$$

Ans. 20

(3)

$$\begin{array}{r} 4 \\ \hline \end{array} 000)2010|000 \text{ — 2000 over.}$$

Ans. 502

(4)

$$\begin{array}{r} 45 \\ \hline \end{array} 0)3150|0 \text{ (70 dollars [Ans. } 315 \text{])}$$

0

(5)

$$\begin{array}{r} 3 \\ \hline \end{array} 0)354|1 \text{ over.}$$

Ans. 118

(6)

$$\begin{array}{r} 9 \\ \hline \end{array} 0)528|0 \text{ — 60 over.}$$

Ans. 58

PROMISCUOUS QUESTIONS.

(7)	(8)	(9)	(10)
2|0)72|0	5|00)750|00	31|0)124|0(4 acres	7|0)280|0
<u> </u>	<u> </u>	124 [Ans.	<u> </u>
Ans. 36 dollars.	Ans. 150		Ans. 40 days.

PROMISCUOUS QUESTIONS

IN

ADDITION, SUBTRACTION, MULTIPLICATION, AND DIVISION.

Lesson 55.

(2)	(3)	(4)
147)3087(21 dollars	307)3684(12 Ans.	160
294 [Ans.	307	25
<u> </u>	<u> </u>	<u> </u>
147	614	80
147	614	32
		<u> </u>
(5)	(6)	4000
25 45	4829001	100
25 25	300128	220
<u> </u>	<u> </u>	<u> </u>
21		
125 20 20	38632008	160)432|0(27 dol-
50	9658002	32 [lars Ans.
<u> </u>	4829001	<u> </u>
625 420	14487003	112
625		112
420	Ans. 1,449,318,412,128	

Ans. 1,045 dollars.

(7)	(8)	(9)	(10)
31|0)496|0(16 Ans.	2|0)274|0	12)144(12 Ans.	271
31	<u> </u>	12	192
<u> </u>	Ans. 137	<u> </u>	<u> </u>
186		24	Ans. 79
186		24	

Lesson 56.

(1)	(2)
37520	1240
4281	75
<u> </u>	83
Ans. 41,801 dollars.	54
	3230
	1452
	<u> </u>
	1452 Ans. 1,778 dollars.

(3)

200

4

196

3

588

16

3528

588

Ans. 9,408 cents, or 94^{dollars}|08^{cents}.

(4)

11200

1247

12447

14000

12447

Ans. 1,553 dollars.

(5)

Ans. 45,350 dollars.

(6)

141

47

Ans. 188 dollars.

(7)

500

17

121

98

736

736

325

Ans. 411 acres.

(8)

2521

178

Ans. 2,343

(9)

15)345

30

45

45

23 hours, Ans.

(10)

2300

625

Ans. 1,675 dollars.

Lesson 57.

(1)

35)700(20 months Ans.

70

0

(2)

35

25

10)70|0

Ans. 70 months.

(3)

2300

450

575

3325

1125

323

3325

1448

1448

Ans. 1,877 dollars.

(4)

5)000)4725|000

Ans. 945

(5)

2250

4

3)9000

Ans. 3,000 dollars.

(6)

150

60

Ans. 9,000 miles.

(7)

5

5

25)475(19 days Ans.

25

225

225

(8)

2581

37

583

10000

12

Ans. 13,213

(9)

12

300

Ans. 3,600 dol-

[lars.

(10)

1287000

1287

Ans. 1,285,713

COMMON FRACTIONS.

Lesson 62.

(5) 5)6	(6) 3)5	(7) 8)35	(8) 6)911	(9) 21)73(3 $\frac{1}{2}$ Ans. 63 — $\frac{1}{2}$
Ans. 1 $\frac{1}{5}$ dollar.	Ans. 1 $\frac{2}{3}$	Ans. 4 $\frac{3}{8}$	Ans. 151 $\frac{5}{6}$	

$$\begin{array}{r} (10) \\ 10)27 \\ \hline \end{array}$$

Ans. 2 $\frac{7}{10}$

$$\begin{array}{r} (11) \\ 12)33(2\frac{3}{4} \text{ Ans.} \\ 24 \\ \hline 9 \\ 12 \end{array}$$

$$\begin{array}{r} (12) \\ 185)2700(14\frac{11}{18} \text{ Ans.} \\ 185 \\ \hline 850 \\ 740 \\ \hline 110 \end{array}$$

Lesson 63.

(6) 4 $\frac{1}{20}$	(7) 8734	(8) 35	(9) 12 $\frac{3}{8}$	(10) 15 $\frac{6}{16}$	(11)	(12)
4	873	12	15	43	4	
20	7	3	8	16	6	5
—	—	—	—	—	—	—
80	6111	105	96	90	258	9
1	4 Ans. 1 $\frac{1}{8}$	5	15 Ans. 2 $\frac{1}{2}$			8
—	—	—	—	—	—	—
81	6115	101	240			72
Ans. $\frac{81}{20}$	Ans. $\frac{6115}{7}$	Ans. 1 $\frac{1}{8}$	6			3
			246			75
			Ans. 2 $\frac{3}{8}$		Ans. 7 $\frac{1}{8}$	

Lesson 64.

(6) 10)480	(7) 24)39(1 $\frac{1}{2}$ day Ans. 24 — $\frac{1}{2}$	(8) 2)27
Ans. 48		Ans. 13 $\frac{1}{2}$
(9) 23)18883(821	(10) Ans. 900	(11) 192)86457(450 $\frac{57}{192}$
184 [Ans.		768 [Ans.
—	—	—
48	965	17
46	960	12
—	—	—
23	57 192	5 12
23		

Lesson 66.

<p>(2) $12 \overline{)44} (3 \ 4) \frac{12}{11} \left(\frac{3}{11} \right)$ $\frac{36}{8}$ $8 \overline{)12} (1 \ 8)$ $\frac{8}{4} \overline{)8} (2 \ 8)$</p>	<p>(3) $116 \overline{)224} (1 \ 4) \frac{116}{116} \left(\frac{22}{116} \right)$ $\frac{116}{108}$ $108 \overline{)116} (1 \ 108)$ $\frac{108}{8} \overline{)108} (13 \ 8)$</p>	<p>(4) $24 \overline{)36} (1 \ 12) \frac{24}{24} \left(\frac{36}{24} \right)$ $\frac{24}{12}$ $12 \overline{)24} (2 \ 24)$</p>
<p>(5) $14 \overline{)35} (2 \ 7) \frac{14}{14} \left(\frac{35}{14} \right)$ $\frac{28}{7}$ $7 \overline{)14} (2 \ 14)$</p>	<p>$\frac{28}{24}$ $4 \overline{)8} (2 \ 8)$</p>	
<p>(6) $128 \overline{)156} (1 \ 4) \frac{128}{128} \left(\frac{156}{128} \right)$ $\frac{128}{28}$ $28 \overline{)128} (4 \ 112)$ $\frac{16}{16} \overline{)28} (1 \ 16)$ $\frac{12}{12} \overline{)16} (1 \ 12)$ $\frac{4}{4} \overline{)12} (3 \ 12)$</p>	<p>(7) $35 \overline{)1250} (35 \ 5) \frac{35}{35} \left(\frac{1250}{35} \right)$ $\frac{105}{200}$ $200 \overline{)1250} (6 \ 200)$ $\frac{25}{25} \overline{)35} (1 \ 25)$ $\frac{10}{10} \overline{)25} (2 \ 20)$ $\frac{5}{5} \overline{)10} (2 \ 10)$</p>	
<p>(8) $10 \overline{)100} (10 \ 10) \frac{10}{10} \left(\frac{100}{10} \right)$ $\frac{100}{100}$</p>	<p>(9) $55 \overline{)165} (3 \ 55) \frac{55}{55} \left(\frac{165}{55} \right)$ $\frac{165}{165}$</p>	
<p>(10) $343 \overline{)7280} (21 \ 7) \frac{343}{343} \left(\frac{7280}{343} \right)$ $\frac{686}{420}$ $420 \overline{)7280} (17 \ 420)$ $\frac{343}{308}$ $308 \overline{)7280} (23 \ 308)$ $\frac{70}{70} \overline{)343} (4 \ 308)$ $\frac{35}{35} \overline{)70} (2 \ 70)$ $\frac{7}{7} \overline{)35} (5 \ 35)$</p>	<p>(11) $12 \overline{)128} (10 \ 4) \frac{12}{12} \left(\frac{128}{12} \right)$ $\frac{12}{8}$ $8 \overline{)12} (1 \ 8)$ $\frac{4}{4} \overline{)8} (2 \ 8)$</p>	
	<p>(12) $162 \overline{)567} (3 \ 81) \frac{162}{162} \left(\frac{567}{162} \right)$ $\frac{486}{162}$ $162 \overline{)567} (3 \ 486)$ $\frac{81}{81} \overline{)162} (2 \ 162)$</p>	

Lesson 67.

(2)			(3)					(4)		
6	$\frac{5}{7}$ and $\frac{3}{7}$	3	2	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{3}$ and $\frac{4}{3}$	4	2	$\frac{1}{4}$	4
7	7	6	3	3	2	2	2	—	8	—
—	—	—	—	—	—	—	—	—	1	—
42	35	18	6	3	4	6	8	—	9	—
Ans.	$\frac{25}{12}$ and $\frac{13}{12}$		4	4	4	3	3	—	—	—
(5)			(6)					(7)		
	$3\frac{1}{3}$ and $6\frac{1}{5}$		24	12	16	18	24	4	$\frac{2}{9}$ and $\frac{5}{5}$	
	3	5	5	5	5	5	4	8	8	4
—	—	—	—	—	—	—	—	—	—	—
9	30		120	60	80	90	96	—	32	72
1	1		Ans.	$\frac{80}{120}$, $\frac{30}{120}$, $\frac{80}{120}$, and $\frac{36}{120}$				Ans.	$\frac{72}{32}$ and $\frac{20}{32}$	
(8)			(9)					(10)		
	$7\frac{1}{2}$, $5\frac{1}{4}$, and $1\frac{1}{3}$			$\frac{4}{5}$, $\frac{7}{5}$, and $\frac{1}{2}$					$\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{3}$	
	2	4	3	3	4	5	1		$\frac{8}{8}$ and $\frac{2}{3}$	
	14	20	3	7	7	3	3		8	
	1	1	1	—	—	—	—		3	
	15	21	4	21	28	15	3		—	
	$\frac{15}{2}$, $\frac{21}{4}$, and $\frac{4}{3}$		2	2	2	7			24	
2	15	21	4	—	—	—	—		Ans.	$\frac{24}{3}$ and $\frac{2}{3}$
4	4	2	2	42	56	30	21			
—	—	—	—	Ans.	$\frac{56}{42}$, $\frac{30}{42}$, and $\frac{21}{42}$					
8	60	42	8	(11)					(12)	
3	3	3	4		$\frac{16}{2500}$, $\frac{120}{2500}$, and $\frac{2}{25}$				Ans.	$\frac{16}{2500}$, $\frac{120}{2500}$, and $\frac{2000}{2500}$
24	180	126	32						(13)	
Ans.	$\frac{180}{24}$, $\frac{126}{24}$, and $\frac{32}{24}$				$\frac{1}{2}$, $\frac{1}{4}$, $\frac{8}{8}$, $\frac{2}{10}$, and $\frac{8}{8}$				Ans.	$\frac{20}{40}$, $\frac{10}{40}$, $\frac{16}{40}$, $\frac{8}{40}$, and $\frac{8}{40}$

COMMON FRACTIONS.

(Brought over.)

$$\begin{array}{r}
 5500 \\
 1500 \\
 594 \\
 \hline
 3300 \overline{) 7594} \begin{array}{l} 2 \frac{224}{3300} \\ 6600 \\ \hline 994 \\ \hline 3300 \end{array} \\
 \hline
 \end{array}$$

Ans. $5,295 \frac{224}{3300}$

Lesson 69.

<p>(6)</p> $\frac{3}{4}$ from $1\frac{1}{2}$ or $\frac{1}{2}$ from $1\frac{1}{2}$ $ \begin{array}{r} 19 \\ 15 \\ \hline 4 \end{array} $ <p>Ans. $\frac{4}{20}$ or $\frac{1}{5}$ of an acre.</p>	<p>(7)</p> $12\frac{1}{2}$ from $16\frac{1}{3}$ or $12\frac{2}{3}$ from $16\frac{2}{3}$ $ \begin{array}{r} 16\frac{2}{3} \\ 12\frac{2}{3} \\ \hline 4 \end{array} $ <p>Ans. $3\frac{2}{3}$ barrels.</p>	<p>(8)</p> 5 $1\frac{1}{2}$ <p>Ans. $3\frac{1}{2}$ dollars.</p>
---	--	---

(9)

 $\frac{6}{1000}$ from $1\frac{45}{1000}$

$$\begin{array}{r}
 45 \\
 6 \\
 \hline
 39
 \end{array}$$

Ans. $1\frac{39}{1000}$

(10)

 $3\frac{1}{2}$ from $10\frac{3}{8}$
or $3\frac{1}{2}$ from $10\frac{1}{2}$

$$\begin{array}{r}
 10\frac{1}{2} \\
 3\frac{1}{2} \\
 \hline
 7
 \end{array}$$

Ans. $7\frac{2}{20}$ dollars.

(11)

 $\frac{1}{8}$ from $\frac{4}{8}$

$$\begin{array}{r}
 95 \\
 56 \\
 \hline
 570 \\
 475 \\
 \hline
 5320
 \end{array}$$

$$\begin{array}{r}
 18 \\
 56 \\
 \hline
 108 \\
 90 \\
 \hline
 1008 \\
 1008 \\
 \hline
 1008 \\
 1008 \\
 \hline
 3552
 \end{array}$$

Ans. $\frac{3552}{6328}$

(12)

 $\frac{1}{8}$ from $\frac{1}{2}$
or $\frac{3}{8}$ from $\frac{4}{8}$

$$\begin{array}{r}
 4 \\
 3 \\
 \hline
 1
 \end{array}$$

Ans. $\frac{1}{48}$ the most.

(13)

 $\frac{7}{1000}$ from $35\frac{1777}{1000}$

$$\begin{array}{r}
 1777 \\
 1800 \\
 \hline
 14216 \\
 1777 \\
 \hline
 3198600
 \end{array}$$

$$\begin{array}{r}
 1777 \\
 7 \\
 \hline
 12439 \\
 12439 \\
 \hline
 3198600
 \end{array}$$

Ans. $34\frac{187881}{3198600}$

Add 1 to $3198600 \dots 3198600$

Subtract $3198600 \dots 12439$

Ans. $34\frac{187881}{3198600}$

Lesson 70.

$$\begin{array}{r} \text{(6)} \\ \frac{3}{16} \text{ and } 48 \end{array}$$

$$\begin{array}{r} 48 \\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 144 \\ 144 \\ \hline \end{array}$$

$$\begin{array}{r} 144 \\ 16 \end{array}$$

$$16)144(9 \text{ bushels} \\ 144 \quad \text{[Ans.}$$

$$\begin{array}{r} \text{(7)} \\ 5 \text{ and } \frac{5}{5} \end{array}$$

$$\begin{array}{r} 5)25 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \hline \end{array}$$

$$\text{Ans. } \frac{5}{5}$$

$$\begin{array}{r} \text{(8)} \\ 25 \text{ and } 2\frac{1}{2} \end{array}$$

$$\begin{array}{r} 25 \quad 25)50(2 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ 19 \\ \hline \end{array}$$

$$\text{Ans. } 69$$

$$\begin{array}{r} \text{(9)} \\ \frac{1}{8} \text{ and } 2400 \end{array}$$

$$\begin{array}{r} 8)2400 \\ \hline \end{array}$$

$$\text{Ans. } 300 \text{ dollars.}$$

$$\begin{array}{r} \text{(10)} \\ \frac{1}{4} \text{ and } 30 \end{array}$$

$$\begin{array}{r} 30 \\ 4 \\ \hline \end{array}$$

$$\begin{array}{r} 120 \\ 120 \\ \hline \end{array}$$

$$5)120(24 \text{ Ans.}$$

$$\begin{array}{r} 10 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(11)} \\ \frac{1}{15} \text{ of } 487 \end{array}$$

$$\begin{array}{r} 487 \\ 14 \\ \hline \end{array}$$

$$\begin{array}{r} 1948 \\ 487 \\ \hline \end{array}$$

$$\begin{array}{r} 6818 \\ 15)6818(454\frac{1}{3} \text{ Ans.} \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \hline \end{array}$$

$$\begin{array}{r} 81 \\ \hline \end{array}$$

$$\begin{array}{r} 75 \\ \hline \end{array}$$

$$\begin{array}{r} 68 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(12)} \\ 16000 \text{ and } 1\frac{2}{5} \end{array}$$

$$\begin{array}{r} 16000 \\ 3 \\ \hline \end{array}$$

$$\begin{array}{r} 48000 \\ 48000 \\ \hline \end{array}$$

$$\begin{array}{r} 48000 \\ 150)48000(320 \text{ acres Ans.} \\ \hline \end{array}$$

$$\begin{array}{r} 450 \\ \hline \end{array}$$

$$\begin{array}{r} 300 \\ \hline \end{array}$$

$$\begin{array}{r} 300 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \hline \end{array}$$

Lesson 71.

$$\begin{array}{r} \text{(6)} \\ \frac{5}{12} \text{ and } \frac{1}{4} \end{array}$$

$$\begin{array}{r} 12 \quad 5 \\ 5 \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \quad 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(7)} \\ 3\frac{1}{2} \text{ and } \frac{1}{2} \end{array}$$

$$\begin{array}{r} 3 \\ 2 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ 1 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(8)} \\ 2\frac{1}{2} \text{ and } 1\frac{1}{2} \end{array}$$

$$\begin{array}{r} 2 \quad 1 \\ 3 \quad 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \quad 5 \\ 1 \quad 2 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 4)7(1\frac{1}{2} \text{ dollar} \\ 4 \quad \text{[Ans.} \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \hline \end{array}$$

$$\begin{array}{r} 15)49(3\frac{1}{3} \\ 45 \quad \text{[Ans.} \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \hline \end{array}$$

(9)	(10)
$\frac{2}{3}, \frac{3}{4}, \text{ and } \frac{5}{6}$	$\frac{1}{2}, \frac{2}{3}, \text{ and } \frac{7}{8}$
$\begin{array}{r} 5 \quad 2 \\ 4 \quad 3 \\ \hline 20 \quad 6 \\ 8 \quad 5 \\ \hline 160 \quad 30 \end{array}$	$\begin{array}{r} 2 \quad 1 \\ 3 \quad 2 \\ \hline 6 \quad 2 \\ 9 \quad 7 \\ \hline 54 \quad 14 \end{array}$
$\begin{array}{r} 14)54(3 \\ \underline{42} \\ 12)14(1 \\ \underline{12} \\ 2)12(6 \\ \underline{12} \end{array}$	$\begin{array}{r} 14)54(3 \\ \underline{42} \\ 12)14(1 \\ \underline{12} \\ 2)12(6 \\ \underline{12} \end{array}$
Ans. $\frac{30}{160}$ or $\frac{3}{16}$	$\frac{14}{54} 2) \frac{14}{54} (\frac{7}{27} \text{ Ans.}$

(11)	(12)	(13)
$\frac{2}{10} \text{ and } \frac{3}{5}$	$25\frac{1}{2} \text{ and } 7\frac{1}{2}$	$\frac{275}{128} \text{ and } \frac{111}{400}$
$\begin{array}{r} 10 \quad 9 \\ 5 \quad 3 \\ \hline 50 \quad 27 \\ \text{Ans. } \frac{27}{50} \end{array}$	$\begin{array}{r} 25 \quad 7 \\ 4 \quad 2 \\ \hline 100 \quad 14 \\ 1 \quad 1 \\ \hline 101 \quad 15 \\ 12\frac{1}{2} \text{ and } 7\frac{1}{2} \\ \hline 4 \quad 101 \\ 2 \quad 15 \\ \hline 8 \quad 505 \\ 101 \\ \hline 1515 \\ 12\frac{1}{2} \end{array}$	$\begin{array}{r} 128 \quad 111 \\ 4007 \quad 275 \\ \hline 896 \quad 555 \\ 512 \quad 777 \\ \hline 512896 \quad 30525 \\ \hline \text{Ans. } \frac{30525}{512896} \end{array}$
	8)1515	

Ans. 189 $\frac{3}{8}$ dollars.**Lesson 72.**

(6)	(7)	(8)	(9)	(10)
$\frac{1}{2} \text{ by } 10$	$5\frac{3}{8} \text{ by } 4$	$4\frac{2}{3} \text{ by } 7$	$1\frac{4}{5} \text{ by } 17$	$\frac{1}{2} \text{ by } 5$
$\begin{array}{r} 2 \\ 10 \\ \hline 20 \\ \text{Ans. } \frac{20}{20} \end{array}$	$\begin{array}{r} 5 \\ 8 \\ \hline 40 \\ 3 \\ \hline 43 \\ 4\frac{3}{8} \text{ by } 4 \\ \hline 8 \\ 4 \\ \hline 32 \\ \text{Ans. } \frac{32}{43} \end{array}$	$\begin{array}{r} 7)49 \\ \hline 7 \\ \text{Ans. } \frac{7}{7} \end{array}$	$\begin{array}{r} 12 \\ 17 \\ \hline 84 \\ 12 \\ \hline 204 \\ \text{Ans. } \frac{204}{84} \end{array}$	$\begin{array}{r} 20 \\ 5 \\ \hline 100 \\ \text{Ans. } \frac{100}{100} \end{array}$

(11)
 $100\frac{1}{8}$ by 25

$$\begin{array}{r} 100 \\ 8 \end{array}$$

$$\begin{array}{r} 800 \\ 5 \end{array}$$

$$\begin{array}{r} 805 \\ 25 \end{array}$$

$805\frac{1}{2}$ by 25

$$\begin{array}{r} 25 \\ 8 \end{array}$$

$$\begin{array}{r} 200 \\ 25 \end{array}$$

$805\frac{1}{2}$ 200)805($4\frac{1}{2}$ dollars Ans.

$$\begin{array}{r} 800 \\ 25 \end{array}$$

2500 or $4\frac{1}{2}$

(12)
 $\frac{1}{2}$ by 105

$$\begin{array}{r} 105 \\ 12 \end{array}$$

$$\begin{array}{r} 210 \\ 105 \end{array}$$

$$\begin{array}{r} 1260 \\ 1260 \end{array}$$

Ans. $12\frac{1}{2}$

(13)
 $175\frac{1}{5}$ by 25

$$\begin{array}{r} 25)175(7 \\ 175 \\ \hline \end{array}$$

$175\frac{1}{5}$ [Ans.

Lesson 73.

(6) 56 by $\frac{7}{8}$

$$\begin{array}{r} 56 \\ 8 \end{array}$$

$$\begin{array}{r} 7)448 \\ \hline \end{array}$$

Ans. 64

(7) 110 by $5\frac{1}{2}$

$$\begin{array}{r} 5 \\ 2 \end{array}$$

$$\begin{array}{r} 10 \\ 1 \end{array}$$

$$\begin{array}{r} 11 \\ 1\frac{1}{2} \end{array}$$

$$\begin{array}{r} 110 \\ 2 \end{array}$$

11)220(20 Ans. $2\frac{1}{2}$ or $\frac{5}{2}$

$$\begin{array}{r} 22 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \end{array}$$

(8) 87 by $1\frac{1}{2}$

$$\begin{array}{r} 87 \\ 5 \end{array}$$

$$\begin{array}{r} 12)435(36\frac{1}{2} \\ 36 \end{array}$$

Ans. 1200

(9) 100 by $1\frac{1}{2}$

$$\begin{array}{r} 100 \\ 12 \end{array}$$

(10) 112 by $\frac{3}{8}$

$$\begin{array}{r} 112 \\ 8 \end{array}$$

$$\begin{array}{r} 3)896 \\ \hline \end{array}$$

Ans. 298 $\frac{2}{3}$

(11) 42 by $1\frac{1}{6}$

$$\begin{array}{r} 160 \\ 42 \end{array}$$

$$\begin{array}{r} 32 \\ 64 \end{array}$$

84)6720(80 Ans.

$$\begin{array}{r} 672 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \end{array}$$

(12) 62 by $7\frac{3}{4}$

$$\begin{array}{r} 7 \\ 4 \end{array}$$

$$\begin{array}{r} 28 \\ 3 \end{array}$$

$$\begin{array}{r} 31 \\ 3\frac{1}{4} \end{array}$$

$$\begin{array}{r} 62 \\ 4 \end{array}$$

31)248(8 Ans.

$$\begin{array}{r} 248 \\ \hline \end{array}$$

(13) 25 by $1\frac{1}{8}$

$$\begin{array}{r} 25 \\ 16 \end{array}$$

$$\begin{array}{r} 150 \\ 25 \end{array}$$

Ans. 400 miles.

Lesson 74.

(6)

$$\begin{array}{r} \frac{3}{10} \text{ by } \frac{2}{10} \\ 3)9 \quad 3 \\ \hline \quad 20 \\ \quad 3 \quad \hline \quad \frac{3}{10} \quad 60 \\ \quad \frac{3}{10} \text{ or } 6 \text{ Ans.} \end{array}$$

(7)

$$\begin{array}{r} 6\frac{1}{2} \text{ by } \frac{3}{10} \\ 6 \quad 5 \\ 5 \quad 3 \\ \hline 30 \quad 15 \\ 4 \quad 1\frac{1}{2} \\ \hline 34 \quad 34 \\ 4\frac{3}{5} \quad 10 \\ \hline 340 \\ 1\frac{1}{5} \end{array}$$

(8)

$$\begin{array}{r} 10\frac{1}{10} \text{ by } 1\frac{1}{2} \\ 10 \quad 1 \\ 10 \quad 4 \\ \hline 100 \quad 4 \\ 5 \quad 1 \\ \hline 105 \quad 5 \\ 10\frac{5}{10} \text{ by } \frac{1}{2} \\ 5)105 \\ \hline 21 \\ 21 \\ \hline 21 \quad 5 \\ 4 \quad \hline 84 \\ 10)84 \end{array}$$

(9)

$$\begin{array}{r} 2\frac{2}{5} \text{ by } 11\frac{1}{2} \\ 2 \quad 11 \\ 5 \quad 8 \\ \hline 10 \quad 88 \\ 2 \quad 7 \\ \hline 12 \quad 95 \\ 1\frac{2}{5} \text{ by } 2\frac{1}{8} \\ 95 \quad 5 \\ \hline 475 \quad 12 \\ 1\frac{2}{5} \quad 8 \\ \hline 96 \\ 1\frac{2}{5} \end{array}$$

$$\begin{array}{r} 15)340(22\frac{2}{3} \text{ Ans.} \\ 30 \\ \hline 40 \\ 30 \\ \hline 10 \text{ or } \frac{2}{3} \end{array}$$

(10)

$$\begin{array}{r} \frac{1}{8} \text{ by } \frac{1}{8} \\ 5 \quad 8 \\ \hline 40 \\ 4\frac{0}{8} \quad 6)40 \\ \hline 6\frac{4}{8} \text{ or } 6\frac{1}{2} \text{ Ans.} \end{array}$$

(11)

$$\begin{array}{r} \frac{3}{15} \text{ by } \frac{4}{10} \\ 3)9 \\ \hline 3 \\ \frac{3}{15} \\ 40 \\ 3 \\ \hline 120 \\ 1\frac{2}{5} \end{array}$$

(12)

$$\begin{array}{r} \frac{3}{15} \text{ by } \frac{1}{4} \\ 4)8 \\ \hline 2 \\ \frac{2}{15} \\ 5)25 \\ \hline 5 \\ \text{Ans. } \frac{2}{5} \end{array}$$

(13)

$$\begin{array}{r} \frac{3\frac{1}{2}}{230} \text{ by } 1\frac{2}{10} \\ 230 \\ 3 \\ \hline 690 \\ \frac{3\frac{1}{2}}{690} \quad 35 \\ 100 \\ \hline 3500 \\ \frac{3\frac{1}{2}}{690} \end{array}$$

$$15)120(8 \text{ Ans.} \\ 120$$

$$690)3500(5\frac{1}{8} \text{ Ans.} \\ 3450$$

$$10)\frac{50}{690}(\frac{5}{8}$$

DECIMAL FRACTIONS.

Lesson 76.

(3) 4)3.0(.75 Ans. <u>28</u> 20 20	(4) 2)3(1.5 Ans. <u>2</u> 10 10	(5) 64)1.00(.015625 Ans. <u>64</u> 360 320 <u>400</u> 384
(6) 12)45(3.75 Ans. <u>36</u> 90 84 <u>60</u> 60	(7) 2400)3.000(.00125 Ans. <u>2400</u> 6000 4800 <u>12000</u> 12000	<u>160</u> 128 <u>320</u> 320
(8) 5)7(1.4 Ans. <u>5</u> 20 20	(9) 8)5.0(.625 Ans. <u>48</u> 20 16 <u>40</u> 40	(10) 25)14.0(.56 Ans. 2.56 <u>125</u> 150 150

Lesson 77.

(2) 3)2.0(.66666 18 [.6667 nearly Ans. <u>18</u> 20 18 <u>20</u> 18 <u>20</u> 18	(3) 12)1.00(.0833 about 96 [Ans. <u>96</u> 40 36 <u>40</u> 36 <u>4</u>	(4) 7)13(1.857 about 7 [Ans. <u>7</u> 60 56 <u>40</u> 35 <u>50</u> 49 <u>1</u>
---	--	--

$$\begin{array}{r} \text{(5)} \\ 1707 \overline{) 121.00} \text{ (.07088459} \\ 11949 \text{ [.070885 nearly Ans.} \end{array}$$

$$\begin{array}{r} 15100 \\ 13656 \\ \hline \end{array}$$

$$\begin{array}{r} 14440 \\ 13656 \\ \hline \end{array}$$

$$\begin{array}{r} 7840 \\ 6828 \\ \hline \end{array}$$

$$\begin{array}{r} 10120 \\ 8535 \\ \hline \end{array}$$

$$\begin{array}{r} 15850 \\ 15363 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(6)} \\ 74 \overline{) 311} \text{ (4.2 about Ans.} \\ 296 \end{array}$$

$$\begin{array}{r} 150 \\ 148 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \end{array}$$

$$\begin{array}{r} \text{(7)} \\ 25 \overline{) 75} \text{ (3 Ans.} \end{array}$$

$$\begin{array}{r} \text{(8)} \\ 125 \overline{) 1000} \text{ (8 Ans.} \end{array}$$

$$\begin{array}{r} 00 \end{array}$$

$$\begin{array}{r} \text{(9)} \\ 125 \overline{) 125} \text{ (1 Ans.} \end{array}$$

$$\begin{array}{r} \text{(10)} \\ 36 \overline{) 100} \text{ (2} \\ 72 \end{array}$$

$$\begin{array}{r} 28 \overline{) 36} \text{ (1} \\ 28 \end{array}$$

$$\begin{array}{r} 8 \overline{) 28} \text{ (3} \\ 24 \end{array}$$

$$\begin{array}{r} 4 \overline{) 8} \text{ (2} \\ 8 \end{array}$$

$$\begin{array}{r} \text{(11)} \\ 688 \overline{) 1000} \text{ (1} \\ 688 \end{array}$$

$$\begin{array}{r} 312 \overline{) 688} \text{ (2} \\ 624 \end{array}$$

$$\begin{array}{r} 64 \overline{) 312} \text{ (4} \\ 256 \end{array}$$

$$\begin{array}{r} 56 \overline{) 64} \text{ (1} \\ 56 \end{array}$$

$$\begin{array}{r} 8 \overline{) 56} \text{ (7} \\ 56 \end{array}$$

Lesson 78.

$$\begin{array}{r} \text{(2)} \\ .00004 \\ .27 \\ 451. \\ 13.003 \\ \hline \text{Ans. 464.27304} \end{array}$$

$$\begin{array}{r} \text{(3)} \\ 4 \overline{) 3.0} \quad 3 \overline{) 2.0} \quad 5 \overline{) 4.0} \quad 2 \overline{) 1.0} \\ .75 \quad .6667 \quad .8 \quad .5 \\ .75 \\ .6667 \\ .8 \\ .5 \end{array}$$

$$\begin{array}{r} 2.7167 \end{array}$$

Ans. 2.717 dollars nearly.

$$\begin{array}{r}
 (4) \\
 4)12 \quad 9)4.0 \quad 20)17.0(.85 \\
 \hline
 3 \quad .4444 \text{ \&c.} \quad 160 \\
 \hline
 100 \\
 100
 \end{array}$$

$$\begin{array}{r}
 (5) \\
 .875 \\
 2.0625 \\
 .25 \\
 \hline
 \text{Ans. 3.1875 cords.}
 \end{array}$$

$$\begin{array}{r}
 7.9 \\
 3. \\
 .4444 \text{ \&c.} \\
 .85 \\
 \hline
 \end{array}$$

Ans. 12.1944 about.

$$\begin{array}{r}
 (6) \\
 27.01 \\
 251. \\
 .3801 \\
 3.8 \\
 \hline
 \text{Ans. 282.1901}
 \end{array}$$

$$\begin{array}{r}
 (7) \\
 .75 \\
 .25 \\
 .50 \\
 \hline
 1.50 \quad 50)150(\frac{1}{2} \\
 \text{Ans. } 1\frac{1}{2}
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 5.75 \\
 4.008 \\
 .0203 \\
 \hline
 \text{Ans. 9.7783}
 \end{array}$$

$$\begin{array}{r}
 (9) \\
 .4 \\
 17.20 \\
 6.002 \\
 .0011 \\
 \hline
 \text{Ans. 23.6031}
 \end{array}$$

$$\begin{array}{r}
 (10) \\
 2)1.0 \quad 8)1.0 \quad 4)3.0 \quad 20)1.00(.05 \\
 \hline
 .5 \quad .125 \quad .75 \quad 100 \\
 \hline
 .5 \\
 .125 \\
 .75 \\
 .1 \\
 .05 \\
 \hline
 \end{array}$$

Ans. 1.525 dollar.

Lesson 79.

$$\begin{array}{r}
 (2) \\
 4. \\
 3.0175 \\
 \hline
 \text{Ans. .9825}
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 8)5.0 \quad 20)3.0(.15 \\
 \hline
 .625 \quad 20 \\
 \hline
 100 \\
 100 \\
 .625 \\
 .15 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 (4) \\
 .875 \\
 .75 \\
 \hline
 \text{Ans. .125 of a} \\
 \text{[dollar.]}
 \end{array}$$

Ans. .475 of a dollar.

$\begin{array}{r} 5)4.0 \\ \underline{.8} \\ .8 \\ \underline{.8} \\ .6667 \\ \underline{.6667} \\ \text{Ans. } .1333 \text{ a-} \\ \text{[bout.} \end{array}$	$\begin{array}{r} (5) \\ 3)2.0 \text{ (.6666 \&c.)} \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \end{array}$	$\begin{array}{r} (6) \\ 5 \\ \underline{.5} \\ \text{Ans. } 4.5 \end{array}$	$\begin{array}{r} (7) \\ \underline{.375} \\ .0625 \\ \underline{.0625} \\ \text{Ans. } .3125 \text{ of a} \\ \text{[dollar.} \end{array}$	$\begin{array}{r} (8) \\ 17.375 \\ \underline{11.00005} \\ \text{Ans. } 6.37495 \end{array}$
$\begin{array}{r} (9) \\ .625 \\ \underline{.5625} \\ .0625 \\ \underline{.0625} \\ .0000 \\ \underline{.0000} \\ 625)10000(16 \\ \underline{625} \\ 3750 \\ \underline{3750} \end{array}$	$\begin{array}{r} (10) \\ 60)55.0 \text{ (.9166 \&c.)} \\ \underline{540} \\ 100 \\ \underline{60} \\ 400 \\ \underline{360} \\ 400 \\ \underline{360} \\ 40 \end{array}$	$\begin{array}{r} 12)1.00 \text{ (.0833 \&c.)} \\ \underline{96} \\ 40 \\ \underline{36} \\ 40 \\ \underline{36} \\ 4 \end{array}$	$\begin{array}{r} 625)825 \text{ (} \frac{1}{16} \text{ Ans.} \\ \underline{1875} \end{array}$	
		$\begin{array}{r} .9166 \\ \underline{.0833} \\ \text{Ans. } .8333 \text{ of an hour about.} \end{array}$		

Lesson 80.

$\begin{array}{r} (2) \\ .043 \\ \underline{12} \\ 86 \\ \underline{43} \\ \text{Ans. } .516 \end{array}$	$\begin{array}{r} (3) \\ 6.25 \\ \underline{8} \\ \text{Ans. } 50.00 \end{array}$	$\begin{array}{r} (4) \\ .75 \\ \underline{.5} \\ \text{Ans. } .375 \text{ of} \\ \text{[a dollar.} \end{array}$	$\begin{array}{r} (5) \\ 1.75 \\ \underline{1.2} \\ 350 \\ \underline{175} \\ \text{Ans. } 2.100 \text{ dol-} \\ \text{[lars.} \end{array}$
$\begin{array}{r} (6) \\ .6 \\ \underline{10} \\ \text{Ans. } 6.0 \text{ dollars.} \end{array}$	$\begin{array}{r} (7) \\ .003 \\ \underline{.0009} \\ \text{Ans. } .0000027 \end{array}$	$\begin{array}{r} (8) \\ .125 \\ \underline{21} \\ 125 \\ \underline{250} \\ \text{Ans. } 2.625 \text{ dollars.} \end{array}$	

3) 2.0	(9)	3) 1.0	(10)	(11)
			.0125	.75
			.25	100
<u>.6666 &c.</u>	<u>.3333 &c.</u>		<u>625</u>	Ans. 75.00
183333			250	[dollars.
66666				
		Ans. .003125		
<u>1099999</u>				
1099999				
1099999				
1099999				
1099999				
<u>12222088889</u>				
12.22 dollars about	Ans.			

Lesson 81.

(4) .003).050(16.6666 &c. <u>3</u> 16.667 Ans.	(5) 10)27.25 <u> </u>	(6) 2.5) 1 6.0 (6.4 dollars [Ans. <u>150</u>
<u>20</u> 18 <u>20</u> 18 <u>20</u> 18 <u>20</u> 18 <u>20</u> 18 <u>20</u> 18	Ans. 2.725 dollars.	<u>100</u> 100
.125).750(6 dollars 750 [Ans.]	(7)	(8) 6).43 <u> </u> .071666 &c. [nearly. Ans. .07167 of a mile
.0403)37.0000(918.114 about Ans.	(10)	
<u> </u> 3627 <u>730</u> 403 <u>3270</u> 3224 <u>460</u> 403 <u>570</u> 403 <u>1670</u> 1612 <u>58</u>		11
(9) .2).0004 <u> </u> Ans. 0.002		.75) 9.00 (12 cents 75 [Ans. <u> </u> 150 150
(12) 7.5)375.0(50 Ans. <u>375</u> 0	(13) 1|00)374.5 <u> </u> Ans. 3.745	(14) 13|000)|005.2(.0004 &c. 52

Lesson 82.

(1) 3)27.15 Ans. 9.05 dol- [lars.	(2) 6)45 Ans. 7.5	(3) 16)3.68 (.23 Ans. 32 48 48	(4) 2)432.54 Ans. 216.27 [acres.
(5) .048 5 6)240 Ans. .04	(6) 7.61 16 4566 761 Ans. 121.76	(7) .36 3 2)108 Ans. 54	(8) .037 4 Ans. .148
(9) 4 8 Ans. 32 dollars.	(10) 8)5640 Ans. 705	(11) 4)11.6 Ans. 2.9 dollars.	(12) .43 3 Ans. 1.29

PROMISCUOUS QUESTIONS IN FRACTIONS.**Lesson 83.**

(1)	(2)	(3)
[length,		450
$\frac{1}{4}$, $\frac{1}{2}$, and 2 feet whole	4)7	20
or $\frac{1}{2}$, $\frac{2}{4}$, and 2 feet,	—	—
or $\frac{3}{4}$ and 2 feet.	Ans. $1\frac{3}{4}$ and 1.75	Ans. 9,000
2 feet then is $\frac{1}{4}$		[dollars.
4		
—		
Ans. 8 feet.		
(4)	(5)	(6)
.9	32.6666 &c.	12
.875	Ans. 32.667 nearly.	3
—		—
Ans. .025		2)36
		—
	Ans. 18	
		(7)
		$\frac{1}{2}$ divide by $\frac{3}{4}$
		2 1
		3 4
		—
		6 4
		$\frac{1}{3}$ or $\frac{2}{3}$ Ans.

(8)

$9\frac{1}{4}$

9

4

—

36

1

—

37

$\frac{37}{4}$

4)16

4

4

(9)

16)148(9

144

—

4)16(4

16

4)148($\frac{37}{4}$ Ans.

(10)

or $\frac{1}{16}$, $\frac{3}{8}$, $\frac{1}{4}$, and $\frac{3}{8}$,
or $\frac{1}{16}$, $\frac{3}{8}$, $\frac{1}{4}$, and $\frac{3}{8}$

1

6

4

24

—

35

$\frac{35}{16}$

16)35($2\frac{3}{16}$ Ans.

32

—

$\frac{3}{16}$

Ans.

37

4

—

16

$\frac{148}{16}$

(12)

$9\frac{1}{2}$ divide by $\frac{7}{8}$

9

5

—

45

4

—

49

$\frac{49}{5}$

by $\frac{7}{8}$

7)49

—

7

8

—

56

$\frac{56}{5}$

5)56($11\frac{1}{5}$ Ans.

5

—

6

5

—

$\frac{1}{5}$

(13)

$11\frac{1}{2}$ divide by $5\frac{1}{4}$

11

3

—

33

2

—

35

$\frac{35}{3}$

by $\frac{3}{4}$

23

23

3

—

69

$\frac{140}{69}$

69)140($2\frac{2}{69}$

138

—

$\frac{2}{69}$

[Ans.

(11)

$\frac{15}{100}$ 15)100(6

90

—

10)15(1

10

—

5)15($\frac{3}{2}$

[Ans.

5)10(2

10

Lesson 84.

(1)

$9\frac{3}{4}$ and $7\frac{1}{8}$
or $9\frac{1}{2}$ and $7\frac{1}{8}$

$9\frac{1}{2}$

$7\frac{1}{8}$

—

$1\frac{1}{8}$ dollar Ans.

(2)

$\frac{1}{2}$, $\frac{1}{3}$, and 2,000 dollars,
or $\frac{3}{8}$, $\frac{2}{3}$, and 2,000 dollars,
or $\frac{3}{8}$ and 2,000 dollars.

2,000 dollars then is $\frac{1}{6}$

6

12,000 dollars Ans.

(3)

$\frac{3}{4}$ divide by $\frac{3}{8}$

3)3

—

8

—

8

Ans. $\frac{3}{4}$ or 2
[bushels.

$$\begin{array}{r} \text{(4)} \\ \frac{2}{3} \text{ of } \frac{3}{8} \\ 3 \quad 3 \\ 8 \quad 2 \\ \hline 24 \quad 6 \end{array}$$

$$\frac{6}{24} \text{ or } \frac{1}{4} \quad 3000$$

Ans. 12,000 dollars.

$$\begin{array}{r} \text{(5)} \\ 6 \overline{)2472} \\ \hline \text{Ans. 412} \end{array}$$

$$\begin{array}{r} \text{(6)} \\ \frac{2}{3} \text{ read and write, } \frac{1}{3} \text{ do not} \\ \frac{2}{4} \text{ of } \frac{1}{3} \\ 4 \quad 1 \\ 3 \quad 3 \\ \hline 12 \quad 3 \\ \frac{3}{12} \text{ or } \frac{1}{4} \end{array}$$

$\frac{2}{3}$, $\frac{1}{4}$, and 5 scholars.
or $\frac{8}{12}$, $\frac{3}{12}$, and 5 scholars.
or $\frac{11}{12}$ and 5 scholars.

5 scholars then are $\frac{1}{12}$

12

Ans. 60

$$\begin{array}{r} \text{(7)} \\ 516 \\ 7 \\ \hline 3 \overline{)3612} \end{array}$$

Ans. 1,204 dollars.

$$\begin{array}{r} \text{(8)} \\ \frac{2}{3} \text{ of } 12\frac{1}{3} \\ 12 \\ 3 \\ \hline 36 \\ 1 \\ \hline 37 \\ \frac{2}{3} \text{ of } \frac{37}{3} \\ \text{[Ans. } \frac{4}{3} \text{]} \\ 4 \quad 37 \\ 3 \quad 3 \end{array}$$

$$\begin{array}{r} \text{(9)} \\ .375 \\ 4000 \\ \hline 1500.000 \\ .12 \\ \hline 30 \\ 15 \\ \hline 180.00 \end{array}$$

Ans. 180 dollars.

$$\begin{array}{r} \text{(10)} \\ .875 \overline{)7.000} \quad (8 \text{ dollars} \\ 7000 \quad \text{[Ans. } \frac{2}{3} \text{]} \end{array}$$

$$\begin{array}{r} \text{(11)} \\ .625 \\ .8 \\ \hline .5000 \end{array}$$

Ans. .5 of a dollar.

$$\begin{array}{r} 12 \overline{)111} \\ 12 \quad 111 \\ \hline 111 \\ 12 \overline{)111} \quad (9\frac{1}{4} \text{ dollars Ans.} \\ 108 \\ \hline 3 \\ \frac{3}{12} \text{ or } \frac{1}{4} \end{array}$$

Lesson 85.

$$\begin{array}{r} \text{(8)} \\ \frac{1}{12} \text{ of } 1800 \\ 1800 \\ 17 \\ \hline 126 \\ 18 \end{array}$$

$$\begin{array}{r} 12 \overline{)30600} \quad (2,550 \text{ dol-} \\ 24 \quad \text{[Ans.} \\ \hline 66 \\ 60 \\ \hline 60 \\ 60 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \text{(9)} \\ \frac{2}{3} \text{ of } 8 \quad \frac{5}{6} \text{ of } 12 \quad \frac{7}{8} \text{ of } 20 \\ 8 \quad 12 \quad 20 \\ 3 \quad 5 \quad 7 \\ \hline 2 \overline{)24} \quad 3 \overline{)60} \quad 5 \overline{)140} \end{array}$$

Ans. second 12, third 20, fourth 28 dollars.

$$\frac{11}{13} \text{ of } 180$$

$$\begin{array}{r} 180 \\ 150 \\ \hline 90 \\ 18 \end{array}$$

$$135)27000(200 \text{ pounds Ans.}$$

$$270$$

$$00$$

(11)

$$\frac{4500}{6000} 4500)6000(1$$

$$4500$$

$$1500)4500(\frac{3}{2} \text{ Ans. } 1500)4500(3$$

$$4500$$

Lesson 86.

$$\text{Ans. } \frac{640}{80} \text{ (1)}$$

$$8|0)64|0 \text{ (2)}$$

Ans. 8 times.

$$\frac{5}{80} 5)80(16 \text{ (3)}$$

$$5$$

$$30$$

$$30$$

$$5)80(\frac{16}{5} \text{ Ans.}$$

(5)

$$\frac{1}{3} \begin{array}{r} 1 \\ 3 \\ \hline 2 \end{array} \text{ (4)}$$

$$\frac{1}{2}$$

$$3$$

$$2$$

$$3$$

$$2$$

$$\text{Ans. } \frac{2}{3}$$

$$6\frac{3}{4} \quad 2\frac{1}{4}$$

$$6 \quad 2$$

$$4 \quad 4$$

$$\hline 24 \quad 8$$

$$3 \quad 1$$

$$\hline 27 \quad 9$$

$$2\frac{7}{4} \quad \frac{9}{4}$$

$$\text{John } \frac{2}{27}, \frac{2}{4}$$

$$\text{Samuel } \frac{27}{27}, \frac{27}{4}$$

$$\text{William } \frac{4}{27}, \frac{4}{4}$$

dividing

$$27 \quad 9$$

$$4 \quad 4$$

$$\hline 108 \quad 36$$

$$108$$

dividing

$$27)27(1$$

$$4$$

$$\hline 4$$

$$4$$

$$21\frac{3}{8}$$

$$2$$

$$16$$

$$\hline 32$$

$$13$$

$$\hline 45$$

$$4\frac{5}{8}$$

$$\frac{4}{27}, \frac{4}{4}$$

dividing

$$16$$

$$27$$

$$\hline 112$$

$$32$$

$$4)432$$

$$108$$

$$\text{Ans. John } \frac{2}{108} \text{ or } \frac{1}{54}, \text{ Samuel } \frac{4}{18} \text{ or } \frac{1}{4}, \text{ and William } \frac{4}{108} \text{ or } \frac{1}{27}$$

$$45)108(2$$

$$90$$

$$\hline 18)45(2$$

$$36$$

$$\text{Greatest common divisor, } 9)18(2$$

$$18$$

FEDERAL MONEY.

Lesson 88.

(4)	(5)	(6)
\$ 42	1,600 mills	2,317 cents
Ans. 420 dimes	Ans. 160 cents	Ans. \$ 23.17
Ans. 4,200 cents	Ans. 16 dimes	
Ans. 42,000 mills	Ans. \$ 1.6	
\$ 42.20	1,650 mills	
Ans. 422 dimes	Ans. 165 cents	
Ans. 4,220 cents	Ans. 165 dimes	
Ans. 42,200 mills	Ans. \$ 1.65	
\$ 42.25	(7)	(8)
Ans. 422.5 dimes	15	\$ 5,827.37
Ans. 4,225 cents	10	Ans. 582,737 cents
Ans. 42,250 mills	\$ 150	
\$ 42.259	Ans. 1,500 dimes	
Ans. 422.59 dimes	Ans. 15,000 cents	
Ans. 4,225.9 cents	(9)	(10)
Ans. 42,259 mills	83,254 mills	\$ 250
	Ans. \$ 83.254	Ans. 25,000.

Lesson 89.

(1)	(2)	(3)
1825.043	180.	27½
2875	2.50	5)40(.8
835.		40
1750	Ans. \$ 177.50	27.8
.375		450
Ans. \$ 2,180.793		1390
(4)	(5)	
35)45.25 (1.2928	13.75	4)33
35	4	8)211.6666 &c.
\$ 1.293 nearly	55.00	8.25
[Ans.	1	26.4583
210	55.	
70	13.	
325	8.25	
315	26.458	
100		
70		
300		
280		
20		
	102.708 dollars about Ans.	

REDUCTION OF COMPOUND NUMBERS.

<p>(6)</p> $\begin{array}{r} 1.25 \\ .41\frac{1}{2} \\ \hline .83\frac{1}{2} \text{ or } \frac{5}{6} \\ 42 \\ 5 \\ \hline 6)210 \\ \hline \text{Ans. } \$35 \end{array}$	<p>(7)</p> $\begin{array}{r} 26 \\ 13 \\ \hline 78 \\ 26 \\ \hline 6)338 \\ \hline \text{Ans. } 56.333 \text{ \&c.} \end{array}$	<p>(8)</p> $\begin{array}{r} 83 \\ .75 \\ \hline 415 \\ 581 \\ \hline 1.125)62.250 \text{ (Ans. } 55.333 \text{ \&c. [or } 55\frac{1}{3} \text{)} \\ 5625 \\ \hline 6000 \\ 5625 \\ \hline 3750 \\ 3375 \\ \hline 3750 \\ 3375 \\ \hline 375 \end{array}$
<p>(9)</p> $\begin{array}{r} 3777.04 \\ 12057 \\ .125 \\ \hline \text{Ans. } \$3,789.222 \end{array}$	<p>(10)</p> $\begin{array}{r} 3125 \\ 100 \text{ gals.} \\ \hline 312500 \\ 4 \text{ hhds.} \\ \hline 12500 \end{array}$	
	$\begin{array}{r} 2500 \\ 1304.07 \\ 125 \\ 245 \\ 1250 \\ \hline 5424.07 \\ 4327.17 \\ \hline \text{Ans } \$1,096.90 \end{array}$	

REDUCTION OF COMPOUND NUMBERS.

Lesson 98.

<p>(1)</p> $\begin{array}{r} 28 \\ 16)36000(2250 \\ 32 \\ \hline 40 \\ 32 \\ \hline 80 \\ 80 \\ \hline 0 \end{array}$	<p>(2)</p> $\begin{array}{r} 4 \\ 20 \\ 80(1 \text{ T.} \\ 8 \\ 20 \\ \hline 10 \text{ lbs. } 0 \end{array}$	<p>(3)</p> $\begin{array}{r} 5 \\ 20)4312(215(17 \text{ lbs.} \\ 40 \\ \hline 31 \\ 20 \\ \hline 112 \\ 100 \\ \hline 12 \text{ pwt.} \end{array}$
	<p>(4)</p> $\begin{array}{r} 20 \\ 5 \\ 20 \\ \hline 100 \\ 4 \\ \hline 400 \\ 28 \\ \hline 32 \\ 8 \\ \hline \text{Ans. } 11,200 \end{array}$	

$$\begin{array}{r}
 (4) \\
 6 \\
 20 \\
 \hline
 120 \\
 24 \\
 \hline
 48 \\
 24 \\
 \hline
 \text{Ans. } 2880
 \end{array}$$

$$\begin{array}{r}
 (5) \\
 \text{lb } \frac{3}{4} \text{ } \frac{3}{2} \text{ } \frac{3}{2} \text{ } \frac{3}{2} \text{ gr.} \\
 2 \text{ } 4 \text{ } 2 \text{ } 0 \text{ } 1 \\
 \hline
 12 \\
 \hline
 24 \\
 \text{Add } 4 \\
 \hline
 28 \\
 8 \\
 \hline
 224 \\
 \text{Add } 2 \\
 \hline
 226 \\
 3 \\
 \hline
 678 \\
 20 \\
 \hline
 13560 \\
 \text{Add } 1 \\
 \hline
 \text{Ans. } 13561
 \end{array}$$

$$\begin{array}{r}
 (6) \\
 20 \overline{) 640} \\
 \underline{3) 32} - 29 \\
 \underline{8) 10} - 23 \\
 \hline
 15
 \end{array}$$

$$\begin{array}{r}
 (7) \\
 7.92 \\
 \underline{100} \\
 12 \overline{) 792.00} \quad 16.5 \\
 \underline{72} \quad \underline{66.0} \quad (4 \text{ Ans.}) \\
 \underline{72} \quad \underline{660}
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 2 \\
 3 \\
 \hline
 6 \\
 8 \\
 \hline
 48 \\
 40 \\
 \hline
 1920 \\
 16.5 \\
 \hline
 960 \\
 1152 \\
 192 \\
 \hline
 6) 316800 \\
 \hline
 \text{Ans. } 5280
 \end{array}$$

$$\begin{array}{r}
 (9) \\
 16.5 \\
 6 \\
 \hline
 99.0 \text{ ft. long. } 66.0 \text{ ft. wide.} \\
 \hline
 99 \\
 66 \\
 \hline
 594 \\
 594 \\
 \hline
 \$ \\
 16) 6534 (408.375 \text{ Ans.} \\
 \underline{64} \\
 \hline
 134 \\
 128 \\
 \hline
 60 \\
 48 \\
 \hline
 120 \\
 112 \\
 \hline
 80 \\
 80
 \end{array}$$

$$\begin{array}{r}
 (10) \\
 18 \\
 16 \\
 \hline
 108 \\
 18 \\
 \hline
 9) 288 \\
 \hline
 \text{Ans. } 32
 \end{array}$$

Lesson 99.

(1)	(2)	(3)	
$\begin{array}{r} 3 \\ 2 \\ \hline 6 \end{array} \begin{array}{r} 1728 \\ 6 \end{array}$	$\begin{array}{r} 37 \\ 4 \\ \hline 148 \\ 5 \end{array} \begin{array}{r} 8 \\ 16 \end{array}$	$\begin{array}{r} \text{bu. pks.} \\ 12 \ 3 \\ 4 \\ \hline 48 \\ 3 \\ \hline 51 \\ .50 \end{array}$	$\begin{array}{r} (4) \\ 36 \ 112 \ 3 \text{ chal.} \\ 108 \\ \hline 4 \end{array}$
Ans. 10,368	$\begin{array}{r} 64 \ 40 \\ \hline 100 \ 6 \text{ ft.} \\ 96 \\ \hline 4 \text{ cubic ft.} \end{array}$	Ans. \$25.50	

(5)	(6)	(7)
$\begin{array}{r} \text{gals. qts. pt.} \\ 12 \ 3 \ 1 \\ 4 \\ \hline 48 \\ 3 \\ \hline 51 \\ 2 \\ \hline 102 \\ 1 \\ \hline \end{array}$	$\begin{array}{r} 4)1313 - 1 \text{ qt.} \\ \hline 9)328 - 4 \text{ gals.} \\ \hline 36 \text{ fir.} \end{array}$	$\begin{array}{r} \text{tier. gals. qts.} \\ 2 \ 5 \ 2 \\ 42 \\ \hline 84 \\ 5 \\ \hline 89 \\ 4 \\ \hline 356 \\ 2 \\ \hline 2)358 \end{array}$
$\begin{array}{r} \text{Ans. } 103 \text{ pts.} \\ .02 \\ \hline \end{array}$		$\begin{array}{r} \text{Ans. } 179 \text{ days.} \end{array}$
Ans. \$2.06		

(8)

$$\begin{array}{r} 4)2217 - 1 \text{ qt.} \\ \hline 63)554 (8 \text{ hhds.} \\ 504 \\ \hline 50 \text{ gals.} \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 \begin{array}{r}
 60 \quad 24 \quad 7 \\
 60)1000000(16666(277(11(1 \text{ w.} \\
 \underline{60} \quad \underline{120} \quad \underline{24} \quad \underline{7} \\
 400 \quad 466 \quad 37 \quad 4 \text{ d.} \\
 \underline{360} \quad \underline{420} \quad \underline{24} \\
 400 \quad 466 \quad 13 \text{ h.} \\
 \underline{360} \quad \underline{420} \\
 400 \quad 46 \text{ min.} \\
 \underline{360} \\
 400 \\
 \underline{360} \\
 40 \text{ sec.}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 \begin{array}{r}
 \text{w. d. h. min. sec.} \\
 1 \quad 4 \quad 7 \quad 0 \quad 48 \\
 \underline{7} \\
 7 \\
 \underline{4} \\
 11 \\
 \underline{24} \\
 44 \\
 \underline{22} \\
 7 \\
 \underline{271} \\
 60 \\
 \underline{16260} \\
 60 \\
 \underline{975600} \\
 48 \\
 \underline{975,648} \text{ sec.} \\
 20
 \end{array}
 \end{array}$$

Ans. 19,512,960

Lesson 100.

$$\begin{array}{r}
 \text{(1)} \\
 \begin{array}{r}
 17^{\circ} \quad 26' \quad 14'' \\
 \underline{60} \\
 1020 \\
 \underline{26} \\
 1046 \\
 \underline{60} \\
 62760 \\
 \underline{14} \\
 \text{Ans. } 62,774
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \\
 \begin{array}{r}
 7)67-4 \text{ d.} \\
 \underline{\quad} \\
 4)9-1 \text{ w.} \\
 \underline{\quad} \\
 2 \text{ mo.}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(5)} \\
 \begin{array}{r}
 36 \\
 \underline{24} \\
 144 \\
 \underline{72} \\
 864 \\
 \underline{6} \\
 27)5184(192 \text{ Ans.} \\
 \underline{27} \\
 248 \\
 \underline{243} \\
 54 \\
 \underline{54}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 \begin{array}{r}
 1782 \\
 \underline{1776} \quad 27 \text{ July.} \\
 6 \quad 31 \text{ Aug.} \\
 365 \quad 30 \text{ Sept.} \\
 \underline{5} \quad 31 \text{ Oct.} \\
 1825 \quad 30 \text{ Nov.} \\
 \underline{366} \quad 31 \text{ Dec.} \\
 200 \quad 20 \text{ Jan.} \\
 \underline{200} \\
 \text{Ans. } 2,391
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(6)} \quad \text{(7)} \\
 \begin{array}{r}
 \text{C. ft.} \quad \text{m. r.} \\
 3 \quad 7 \quad 1 \quad 33 \\
 \underline{8} \quad 8 \\
 24 \quad 8 \\
 \underline{7} \quad 40 \\
 \underline{\quad} \\
 \text{Ans. } \$31 \quad 320 \\
 \quad \quad \underline{33} \\
 \text{Ans. } 353
 \end{array}
 \end{array}$$

<p>(8)</p> <p>m. fath.</p> <p>17 45</p> <p>3)17—2 m.</p> <hr/> <p>5 lea.</p> <p>16</p> <p>40</p> <p>640</p> <p>164</p> <hr/> <p>384</p> <p>64</p> <hr/> <p>10240</p> <p>320 — $\frac{1}{2}$ of 640</p> <p>6)10560</p> <hr/> <p>1760</p> <p>45</p> <p>Ans. 5 lea. 1,805 fath.</p>	<p>(9)</p> <p>28</p> <p>6</p> <p>4)168</p> <hr/> <p>Ans. 42</p>	<p>(10)</p> <p>9</p> <p>144)453779(3151(350 sq. yds.</p> <hr/> <p>432</p> <p>27</p> <hr/> <p>217</p> <p>144</p> <hr/> <p>737</p> <p>720</p> <hr/> <p>179</p> <p>144</p> <hr/> <p>34 sq. in.</p>
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Lesson 101.

<p>(1)</p> <p>2)196</p> <hr/> <p>196</p> <p>3600</p> <hr/> <p>1176</p> <p>588</p> <hr/> <p>705600</p> <p>41650</p> <hr/> <p>4</p> <p>20</p> <p>28)747250(26687(6671(333 T.</p> <hr/> <p>56</p> <p>24</p> <hr/> <p>187</p> <p>168</p> <hr/> <p>192</p> <p>168</p> <hr/> <p>245</p> <p>224</p> <hr/> <p>210</p> <p>196</p> <hr/> <p>14 lbs.</p>	<p>425</p> <p>98</p> <hr/> <p>3400</p> <p>3825</p> <hr/> <p>41650</p> <hr/> <p>67</p> <p>60</p> <hr/> <p>71</p> <p>60</p> <hr/> <p>7</p> <p>4</p> <hr/> <p>3 qrs.</p>	<p>(2)</p> <p>T. cwt. qrs. lbs.</p> <p>3 0 2 17</p> <hr/> <p>20</p> <hr/> <p>60</p> <hr/> <p>4</p> <hr/> <p>240</p> <hr/> <p>2</p> <hr/> <p>242</p> <hr/> <p>28</p> <hr/> <p>1936</p> <hr/> <p>484</p> <hr/> <p>17</p> <hr/> <p>\$.164</p> <p>or \$.1666, &c.</p> <p>or \$ $\frac{1}{6}$. . . 6)6793</p> <hr/> <p>1132.1666, &c.</p> <p>or \$ 1,132.164 Ans.</p>
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(3)		(4)		(5)	
12		5		5	
7		4		5	
<hr/>		<hr/>		<hr/>	
84		20		25	
20	\$.12 $\frac{1}{2}$	8		5	
<hr/>	or \$.125	<hr/>		<hr/>	1728
Ans. 1,680	or \$ $\frac{1}{8}$	8)160		125	125
		<hr/>			<hr/>
		Ans. \$ 20			8640

$$\begin{array}{r} 8640 \\ 3456 \\ \hline 1728 \end{array}$$

(6)		(7)	2150.4	216000.0	(100.4464
2)35217 — 1 pt.		54		21504	[100.446
<hr/>		4		<hr/>	[about Ans.
4)17608	\$.50	<hr/>		96000	
<hr/>	or \$ $\frac{1}{2}$	2)216		86016	
54)4402(81 hhds.		<hr/>		<hr/>	
432	Ans. \$ 108			99840	
<hr/>				86016	
82				<hr/>	
54				138240	
<hr/>				129024	
28 gals.				<hr/>	

$$\begin{array}{r} 92160 \\ 86016 \\ \hline 6144 \end{array}$$

(8)		(9)	
108	31.5	84	
16	5	5	
<hr/>		<hr/>	
648	157.5		
108		Ans. \$ 420	
<hr/>			
1728			
157.5			
<hr/>			
1885.5			
or 1,885 $\frac{1}{2}$ Ans.			

(10)	
12	
20)428(21(1 lb.	
40 12	
<hr/>	
28 9 oz.	
20	
<hr/>	
8 pwts.	

Lesson 103.

$$\begin{array}{r}
 (1) \\
 3 \text{ qrs. } 16 \text{ lbs.} \\
 \text{or } 3\frac{1}{2} \text{ qrs.} \\
 \text{changing to an} \\
 \text{improper fraction} \\
 \frac{28}{3} \\
 \frac{84}{16} \\
 \frac{100}{25}
 \end{array}$$

$$\text{dividing } \frac{100}{25} \text{ qrs. by } 4 \frac{100}{25}$$

$$\text{dividing } \frac{28}{25} \text{ cwt. by } 20$$

$$\begin{array}{r}
 28 \\
 \frac{560}{25} \\
 5) \frac{28}{560} (1\frac{1}{2} \text{ T.}
 \end{array}$$

$$\begin{array}{r}
 5 \\
 60 \\
 112) \frac{300}{224} (2.678 \\
 \frac{760}{672} \\
 \frac{880}{784} \\
 \frac{960}{896}
 \end{array}$$

$$\begin{array}{r}
 (2) \\
 .25 \\
 \text{or } \frac{1}{4} \quad 4)28 \\
 \hline
 \text{Ans. } 7
 \end{array}$$

$$\begin{array}{r}
 25)560(22 \\
 \frac{50}{60} \\
 \frac{50}{10} 25(2 \\
 \frac{20}{5} 10(2 \\
 \frac{10}{10}
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 \frac{14}{14} \\
 \frac{28}{14}
 \end{array}$$

$$\begin{array}{r}
 35)168(4 \text{ oz.} \\
 \frac{140}{28} \\
 \frac{20}{20}
 \end{array}$$

$$\begin{array}{r}
 35)560(16 \text{ pwts.} \\
 \frac{35}{210} \\
 \frac{210}{210}
 \end{array}$$

$$\begin{array}{r}
 (4) \\
 \text{pwts. qrs.} \\
 13 \quad 3
 \end{array}$$

$$24)3.0(.125 \quad 20)13.125(.65625 \text{ of an [ounce Ans.}]$$

$$\begin{array}{r}
 60 \\
 48 \\
 \hline
 120 \\
 120
 \end{array}$$

$$\begin{array}{r}
 112 \\
 100 \\
 \hline
 125 \\
 120 \\
 \hline
 50 \\
 40 \\
 \hline
 100 \\
 100
 \end{array}$$

<p>(5)</p> <p>qrs. nails 3 3</p> <p>or $3\frac{3}{4}$ qrs.</p> <p>3</p> <p>4</p> <hr/> <p>12</p> <p>3</p> <hr/> <p>15 4</p> <p>dividing $\frac{1}{4}$ by 4</p> <hr/> <p>16</p> <p>Ans. $\frac{1}{8}$</p>	<p>(6)</p> <p>.1325</p> <p>8</p> <hr/> <p>fur. 1.0600</p> <p>40</p> <hr/> <p>rods 2.4000</p> <p>16 $\frac{1}{2}$</p> <hr/> <p>64</p> <p>2 - $\frac{1}{2}$</p> <hr/> <p>ft. 6.6</p> <p>12</p> <hr/> <p>in. 7.2</p>	<p>(7)</p> <p>40</p> <p>10</p> <hr/> <p>16)640(40 A., worth \$400</p> <p>64 [Ans.]</p>
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<p>(8)</p> <p>272.25) 187000 (.686868 &c.</p> <p>163350 [.68687 near-</p> <hr/> <p>236500</p> <p>217800</p> <hr/> <p>187000</p> <p>163350</p> <hr/> <p>236500</p>	<p>[ly Ans.]</p>
---	------------------

<p>(9)</p> <p>.8</p> <p>8</p> <hr/> <p>Ans. 6.4, worth \$6.40</p>	<p>(10)</p> <p>cubic ft. cubic in.</p> <p>44 86.4</p> <hr/> <p>1728) 8640(.05</p> <p>8640</p>	<p>5)0 4|4.05</p> <hr/> <p>Ans. .881</p>
---	--	--

Lesson 104.

<p>(1)</p> <p>bu. pks.</p> <p>14 3</p> <p>4) 3.0</p> <hr/> <p>36) 14.75 (.4097 chal. .4097</p> <p>144 9</p> <hr/> <p>350</p> <p>324</p> <hr/> <p>260</p> <p>252</p> <hr/> <p>8</p>	<p>(2)</p> <p>bu.</p> <p>$\frac{3}{8}$</p> <p>2</p> <p>4</p> <hr/> <p>$\frac{3}{8}$ pks.</p> <p>8</p> <p>8</p> <hr/> <p>64</p> <p>$\frac{3}{8}$ qts. 3) 64</p> <hr/> <p>21333 &c. qts.</p> <p>.04</p> <hr/> <p>.85333</p> <p>Ans. \$.85, about.</p>
--	--

Lesson 105.

(1)

T. cwt. qr.
2 3 1

4) 1.0

20) 3.25 (.1025

20

125

120

50

40

100

100

T.

21625)

250.0000 (115.608

21625

[\$ 115.61 nearly

[Ans.

33750

21625

121250

108125

131250

129750

150000

129750

20250

(2)

pwts. grs.

8 8

oz.

5

20

24

8

100

192

24

8

2400

200

2|00)24|00

Ans. 12

(3)

m.

10

fur. rods

2 20

10

8

4|0)2|0.0

8

80

2

82.5

fur. 82.5) 198.0 (2 min.

82.5

1650

330

60

) 19800 (24 sec.

1650

3300

3300

REDUCTION OF COMPOUND NUMBERS.

(4)
sq. m.
 $1\frac{332}{640}$
reducing to an improper fraction
 $\frac{640}{360}$
 $\frac{1000}{1000}$
 $\frac{1000}{640}$
dividing \$ 1000
by $\frac{1000}{640}$ 1|000|640|000
Ans. \$ 640

(5)
T. cubic ft.
2 12 $\frac{1}{2}$
5|0) 1|2.5
25
2.25 T. 2.25) 21.00 (9.333 &c.
2025 [or \$9.33 $\frac{1}{3}$
[Ans.
750
675
750
675
75

(6)
bu. pks.
4 3
4) 3.0
.75
4.75 bu. 4.75) 332.50 (70
3325 [Ans.

(7)
gals. qts. pt.
6 2 1
6 2) 1.0
4 .5
24
2
26
26.5 qts. 26.5) 1590 (.06
1590 [Ans.

(8)
h. m.
3 20
 $\frac{20}{60}$ or $\frac{2}{3}$ or $\frac{1}{3}$
 $3\frac{1}{3}$ h.
reducing to an improper fraction
 $\frac{10}{3}$
 $\frac{3}{3}$
 $\frac{9}{9}$
 $\frac{1}{1}$
 $\frac{10}{10}$
 $1\frac{2}{3}$ h. dividing 10
by $\frac{10}{3}$ 3
10|30
Ans. 3 lea.

(9)
min.
20
20) $24(\frac{1}{3}$ h. dividing 4
by $\frac{1}{3}$ 3
Ans. 12 miles.

$$39^{\circ} 45' 12''$$

$$\begin{array}{r} 60 \overline{) 12.0} \\ 60 \overline{) 45.2} \\ \hline .7533 \text{ \&c.} \end{array}$$

$$39.7533^{\circ} \text{ \&c. } 39.7533^{\circ} 21.0000 (0 \text{ d.}$$

$$\begin{array}{r} 24 \\ 84 \\ 42 \\ \hline) 504.0000 (12 \text{ h.} \\ 397533 \\ \hline 1064670 \\ 795066 \\ \hline 269604 \\ 60 \\ \hline) 16176240 (40 \text{ min.} \\ 1590132 \\ \hline 274920 \\ 60 \\ \hline) 16495200 (41 \text{ sec.} \\ 1590132 \\ \hline 593880 \\ 397533 \\ \hline 196347 \end{array}$$

Lesson 106.

$$(1) \quad \begin{array}{r} 1000 \text{ T.} \\ 1 \\ 20 \\ 20 \\ 4 \\ 80 \\ 28 \\ 64 \\ 16 \end{array}$$

$$\begin{array}{l} 2240 \text{ lbs. in 1 T.} \\ 224^{\circ} \text{ lb. } 2240 \end{array}$$

$$4 \overline{) 2240} \text{ (2) } 5000 \text{ (2) } 4480$$

$$\begin{array}{r} 520 \overline{) 2240} (4 \\ 2080 \end{array}$$

$$\begin{array}{r} 160 \overline{) 520} (3 \\ 480 \end{array}$$

$$\begin{array}{r} 40 \overline{) 160} (4 \\ 160 \end{array}$$

$$(2) \quad \begin{array}{r} .0001 \text{ T.} \\ 20 \end{array}$$

$$\begin{array}{r} .00020 \\ 4 \end{array}$$

$$\begin{array}{r} .008 \\ 28 \end{array}$$

$$\begin{array}{r} 64 \\ 16 \end{array}$$

$$\text{Ans. } .224$$

<p>(3)</p> <p>lb.</p> $\frac{1}{2}$ $\begin{array}{r} 20 \\ 4 \\ \hline 80 \\ 28 \\ \hline 64 \\ 16 \\ \hline 2240 \end{array}$ <p>dividing $\frac{1}{2}$ by 2240</p> $\begin{array}{r} 2 \\ \hline 4480 \end{array}$ <p>Ans. $\frac{1}{4480}$</p>	<p>(4)</p> <p>in. in.</p> <p>$\frac{1}{2}$ or .5</p> <p>12).50(.041666 &c.</p> <p>48 [.041667 nearly</p> <p>[Ans. .12 of an in.</p> $\begin{array}{r} 20 \\ 12 \\ \hline 80 \\ 72 \\ \hline 8 \end{array}$	<p>(5)</p> <p>ft.</p> <p>.01</p> <p>12</p> <p>Ans. .12 of an in.</p> <p>(6)</p> <p>$\frac{1}{320}$</p> <p>$\frac{120}{320}$ or $\frac{1}{2}$ sq. rod</p> <p>12</p> <p>dividing by $\frac{1}{2}$ 2</p> <p>Ans. \$ 24</p>
<p>(7)</p> <p>qr.</p> <p>4).75</p> <p>Ans. .1875 of an A.</p>	<p>(8)</p> <p>C.</p> <p>.2</p> <p>8</p> <p>Ans. 1.6 ft.</p> <p>1.6) 1.60 (1.00 Ans.</p> <p>16</p>	<p>(9)</p> <p>cubic in.</p> <p>$\frac{1}{8}$</p> <p>dividing $\frac{1}{8}$ by 1728</p> <p>3</p> <p>5184</p> <p>Ans. $\frac{1}{5184}$</p>
<p>(10)</p> <p>bu.</p> <p>$\frac{1}{50}$</p> <p>4</p> <p>8</p> <p>32</p> <p>2</p> <p>64</p> <p>$\frac{2}{3}$ pt. 50)64(1.28 pt. Ans.</p> <p>50</p> <p>140</p> <p>100</p> <p>400</p> <p>400</p>	<p>(11)</p> <p>pk.</p> <p>$\frac{1}{5}$</p> <p>5)1.0</p> <p>4).20</p> <p>Ans. .05 of a bu.</p>	<p>(12)</p> <p>d.</p> <p>$\frac{1}{2}$</p> <p>dividing $\frac{1}{2}$ by 365</p> <p>2</p> <p>730</p> <p>Ans. $\frac{1}{730}$</p>

Lesson 107.

(1)				(2)		(3)			
bu.	pk.	bu.	pk.	oz.	pwt.	lbs.	oz.	C. ft.	
2	3	5	1	5	15	5	8	4 7	
4) 3.0		4) 1.0		20) 115.0		16) 8.0 (.5)		8	
<u>.75</u>		<u>.25</u>				<u>80</u>		32	
2.75 bu.		5.25 bu.		.75		5.5 lbs.		7	
2.75				5.75 oz.		5.5			
<u>5.25</u>				5.75		<u>39</u>		39 ft.	
1375				2		495			
550						<u>165</u>			
1375				cwt. 115.0		214.5 lbs. Ans.			
bu. 144375				4					
<u>4</u>				qrs. 2.00					
pk. 1.7500									
or pk. 1½									
(4)		(5)		(6)		(7)			
d.	h.	rods.	ft.	rods.	ft.	ft.	in.	ft.	in.
2	7	16	12	12	5	7	3	3	8
24		16		12		7.25 ft.		3.66 &c. ft.	
<u>2</u>		<u>16½</u>		<u>16½</u>				or 3¾ ft.	
48		96		72		7.25			
<u>7</u>		16		12		<u>3¾</u>			
		8-½		6-½		21.75			
55 h.		12		5		2.41666 - ⅓			
<u>55</u>		<u>276</u>		<u>203</u>		2.41666 - ⅓			
3		276				<u>26.58333</u>			
165 lea.		203				Ans. 26.58 about.			
[Ans.]		<u>828</u>							
		552				ft. in.	ft. in.	ft. in.	
						13 4	6 9	4 6	
27225)	56028.00	(205796				13½ ft.	6.75 ft.	4.5 ft.	
	<u>54450</u>	[about Ans.]							
	157800						6.75		
	<u>136125</u>						<u>13½</u>		
	216750						2025		
	<u>190575</u>						<u>675</u>		
	261750						8775		
	<u>245025</u>						<u>2.25 - ⅓</u>		
	167250						90.00		
	<u>163350</u>						4.5		
	3900						<u>45</u>		
							36		
						Ans. 405.0			

(8)

$$\begin{array}{r}
 \text{ft. in.} \\
 25 \quad 6 \\
 25.5 \text{ ft.} \quad 4 \text{ ft.} \quad 8.91\frac{1}{2} \\
 25.5 \\
 \underline{4} \\
 102.0 \\
 8.91\frac{1}{2} \\
 \hline
 102 \\
 918 \\
 816 \\
 \hline
 908.82 \\
 34 - \frac{1}{2} \\
 34 - \frac{1}{2} \\
 \hline
 8 \\
 16) 909.50 (56 (7 C. \\
 \underline{80} \quad \underline{56} \\
 109 \\
 \underline{96} \\
 13.5 \text{ cubic feet.}
 \end{array}$$

(9)

$$\begin{array}{r}
 \text{ft. in.} \\
 3 \quad 3 \\
 \text{or } 3.25 \text{ ft.} \\
 4 \\
 \hline
 13.00 \\
 8 \\
 \hline
 104 \text{ cubic ft.} \\
 128) 1040 (.8125 \\
 \underline{1024} \quad [\text{Ans.}] \\
 160 \\
 128 \\
 \hline
 320 \\
 256 \\
 \hline
 640 \\
 640
 \end{array}$$

(10)

$$\begin{array}{r}
 \text{m.} \quad \text{ft.} \\
 1 \quad 264 \\
 8 \\
 \underline{40} \\
 320 \\
 16\frac{1}{2} \\
 \hline
 192 \\
 32 \\
 \hline
 5120 \\
 160 - \frac{1}{2} \\
 \hline
 5280 \text{ ft. in} \quad 5280) 26400 (.05 \\
 \underline{26400} \\
 1.05 \text{ m. long.} \\
 \text{multiplying by } \frac{1}{2} \quad 2) 1.05 \\
 \hline
 .525 \\
 640 \text{ acres in} \\
 \text{a sq. m.} \\
 \hline
 2100 \\
 3150 \\
 \hline
 \text{Ans. } 336.00
 \end{array}$$

Lesson 108.

(1)					
cwt.	qrs.	T.	cwt.	qr.	lbs.
3	2	1	2	1	16.8
4		20			
<hr/>					
12		20			
2		2			
<hr/>					
14		22			
28		4			
<hr/>					
112		88			
28		1			
<hr/>					
392		89			
		28			
<hr/>					
		712			
		178			
		16.8			
<hr/>					
392)	2508.8	(6.4 yrs.	365		
	2352		.4		
<hr/>					
	1568		146.0		
	1568		6 yrs. 146 days	Ans.	
<hr/>					
(3)					
min.	sec.	h.	min.	sec.	
3	15	1	20	36	
60		60			
180		60			
15		20			
195		80			
		60			
		4800			
		36			
<hr/>					
195)	4836	(24 m.			
	390				
	936				
	780				
	156	or $1\frac{1}{2}$ m.			
	8				
<hr/>					
)	1248	(6 fur.			
	1170				
	78	or $\frac{7}{8}$ fur.			
	40				
<hr/>					
)	3120	(16 rods.			
	195				
	1170				
	1170				
<hr/>					
(2)					
T.	cwt.	hhds.	gals.		
2	4	2	17		
		63			
<hr/>					
20)	4.0	126			
	.2	17			
<hr/>					
		143	gals.		
<hr/>					
2.2 T.	2.2)	143.0	(65 Ans.		
		132			
<hr/>					
		110			
		110			
<hr/>					
(4)					
pwt.	grs.	lb.	oz.	pwt.	grs.
2	4	1	5	8	20
24		12			
48		12			
4		5			
52		17			
<hr/>					
		20			
		340			
		8			
		348			
		24			
<hr/>					
		1392			
		696			
		20			
<hr/>					
52)	8372	(161 Ans.			
	52				
	317				
	312				
	52				
	52				
<hr/>					

REDUCTION OF COMPOUND NUMBERS.

(5)

	A.	qrs.	sq. rods.
	1	3	30
	4		
	<hr/> 4		
	3		
	<hr/> 7		
	40		
rods. ft. in.			
15 8 3	280		
or 8.25 ft.	30		
	<hr/>		
16.5) 8.25 (.5	310.0	(20 rods Ans.	
825	310		
	<hr/>		
	0		

(6)

ft.	in.	sq. ft.	sq. in.	
3	3	23	108	
or 3.25 ft.				
		144)	1080 (.75	23.75 sq. feet.
			1008	
			<hr/> 720	
			720	

3.25)	23.75 (	7.3076 ft.
	2275	12
	<hr/> 1000	<hr/> 6152
	975	3076
	<hr/> 2500	<hr/> 36912
	2275	3.7 in. nearly.
	<hr/> 2250	
	1950	
	<hr/> 300	

(7)

ft.	ft.	in.	
8	3	9	
	or 3.75 ft.		
	16		
	8		
3.75			
8			
<hr/>			
30.0	128	cubic ft. in a C.	
30) 128 (	4.2666 &c. ft.		
	120	or 4.23	
	<hr/>		
	80		
	60	24	
	<hr/>		
	200	8 — $\frac{2}{3}$ of 12	
	180	3.2 in.	
	<hr/>		
	200		

(8)

4) 27	
	6.75 ft.
	12
	<hr/>
	150
	75
	<hr/>
	9.00 in.

(9)

ft.	in.			
2	3			
or 2.25 ft.	2.25)	30.00	sq. ft.	
		225	(13.333 &c.	
			or 13 $\frac{1}{3}$	
		<hr/>		
		750		
		675		
		<hr/>		
		750		
		675		
		<hr/>		
		750		

multiplying 144
by $\frac{1}{3}$ 3)144

48 sq. in.

(10)

sq. ft.	T.	cubic ft.	
24	1	12	
or 2.25 sq. ft.	50		
	<hr/>		
	50		
	12		
	<hr/>		
2.25)	62.00	ft. reducing	12
	450	$\frac{1}{3}$ of a ft. to in.	5
	<hr/>		
	1700		
	1575		
	<hr/>		
25)	132 $\frac{1}{3}$		

9) 60 (6 $\frac{2}{3}$ in.
54

3) $\frac{2}{3}$

Lesson 109.

(1)			(2)		
gals. qt.	qts. pt.	qts.	bu. pks. qts.	bu. pk. qts.	bu. pks.
2 1	3 1	2	15 2 5	7 1 3	23 2
4	2	2	4	4	4
—	—	—	—	—	—
8	6	4	60	28	92
1	1		2	1	2
—	—		—	—	—
9	7		62	29	94
2			8	8	8
—			—	—	—
18			496	232	752
18			5	3	
7			—	—	
4			501	235	
—			501		
2)29 — 1 pt.			235		
—			752		
4)14 — 2 qts.			—		
—			8)1488		
3 gals.			4)186 — 2 pks.		
			—		

46 bu.

(3)		(4)		(5)
h. min.	h. min.	C. ft.	C. ft.	gals. qts. pt.
4 20	2 40	1 7	6 3	2 3 1
60	60	8	8	4
—	—	—	—	—
240	120	8	48	8
20	40	7	3	3
—	—	—	—	—
260	160	15	51	11
260			51	2
160			15	—
—			—	22
60)100(1 h.			8)36 — 4 ft.	1
60			—	—
—			4 C.	23
40 min.				6 days.

2)138

4)69 — 1 qt.

17 gals.

$$\begin{array}{r}
 \text{(6)} \\
 \text{cwt. qrs. lbs.} \\
 18 \quad 3 \quad 20 \\
 4 \\
 \hline
 72 \\
 3 \\
 \hline
 75 \\
 28 \\
 \hline
 600 \\
 150 \\
 20 \\
 \hline
 2120 \\
 3 \quad 4 \quad 20 \\
 28 \overline{)6360} \quad (227 \overline{)56} (2 \text{ T.} \\
 56 \quad 20 \quad 40 \\
 \hline
 76 \quad 27 \quad 16 \text{ cwt.} \\
 56 \quad 24 \\
 \hline
 200 \quad 3 \text{ qrs.} \\
 196 \\
 \hline
 4 \text{ lbs.}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \text{ft. in.} \\
 33 \quad 7 \\
 12 \\
 \hline
 66 \\
 33 \\
 7 \\
 \hline
 403 \\
 4 \\
 \hline
 12 \overline{)1612} (134 \text{ ft.} \\
 12 \\
 \hline
 41 \\
 36 \\
 \hline
 52 \\
 48 \\
 \hline
 4 \text{ in.}
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 \text{lbs. oz.} \\
 15 \quad 9 \\
 16 \\
 \hline
 90 \\
 15 \\
 9 \quad 16 \\
 \hline
 6 \overline{)249} \quad (41 \overline{)2} \text{ lbs.} \\
 24 \quad 32 \\
 \hline
 9 \quad 9 \text{ oz.} \\
 6 \\
 \hline
 3 \\
 16 \text{ dr. in an oz.} \\
 \hline
 48 (8 \text{ dr.} \\
 48
 \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 \text{hhd. bl. gals.} \\
 1 \quad 1 \quad 16 \\
 2 \\
 \hline
 2 \\
 1 \\
 \hline
 3 \\
 31 \frac{1}{2} \\
 93 \\
 \hline
 1.5 - \frac{1}{2} \text{ of } 3 \\
 16 \\
 5 \overline{)110.5} (22 \text{ gals.} \\
 10 \\
 \hline
 10 \\
 10 \\
 \hline
 .5 \\
 4 \text{ qts. in a gal.} \\
 2.0 \\
 2 \text{ pts. in a qt.} \\
 4 \\
 \hline
 4 \text{ gi. in a pt.} \\
) 16 (3.2 \text{ gi.} \\
 15 \\
 \hline
 10 \\
 10
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 \text{sq. ft. sq. in.} \\
 186 \quad 66 \\
 144 \\
 \hline
 744 \\
 744 \\
 186 \\
 66 \\
 \hline
 26850 \\
 3 \\
 \hline
 144 \overline{)80550} (559.375 \text{ Ans.} \\
 720 \\
 \hline
 855 \\
 720 \\
 \hline
 1350 \\
 1296 \\
 \hline
 540 \\
 432 \\
 \hline
 1080 \\
 1008 \\
 \hline
 720 \\
 720
 \end{array}$$

ADDITION OF COMPOUND NUMBERS.

Lesson 110.

			(7)		
lb	5	11	3	2	grs.
			5	2	16
			2	1	16
	27	0	0	0	18
<hr style="border-top: 1px solid black;"/>					
Ans.	33	0	0	2	10

(8)		
chal.	bu.	pks.
4	16	3
12	0	3
2	3	1
6	18	1
Ans. 25 3 0		

$$\begin{array}{r} \text{m. fur. rods. ft.} \\ 2 \ 0 \ 27 \ 0 \\ 1 \ 0 \ 18 \ 3 \\ \quad \quad 36 \ 10 \\ \quad \quad \quad 5 \\ \hline \text{Ans. } 3 \ 2 \ 2 \ 14 \end{array}$$

(10)

T.	cwt.	qrs.	lbs.
1			
	16	2	18
1	2	0	10
	18		
<hr/>			
Ans.	3	16	3 0

(11)			
bu.	pks.	qts.	pt.
12	3	5	
2	2	2	1
3	0	7	
		6	
	1	4	
<hr/>			
Ans. 19	1	0	1

(13)			
lbs.	oz.	pwt.	grs.
5	11	7	3
6			
2			15
			20
<hr/>			
Ans. 13	11	6	14

Lesson 111.

(9)

(1)			
hhds.	bls.	fir.	gals.
2	1		
1	2	0	6
	1	0	3
<hr style="width: 100%;"/>			
Ans. 5	1	1	0

lea.	fath.
25	2520
13	189
17	1820
3	2260
<hr/>	
Ans. 60	1,500

$$\begin{array}{r} 8 \\ 40 \\ \hline 390 \\ 164 \\ \hline 192 \\ 32 \\ \hline 16 - \frac{1}{2} \\ \hline 5280 \text{ ft. in a mile.} \\ 8 \\ \hline 6 \overline{) 15840} \\ \underline{2640} \\ 6780 (2 \\ \underline{5280} \\ \hline 1500 \end{array}$$

$$\begin{array}{r} \text{A.} \\ 17 \\ 25 \\ 4 \end{array} \begin{array}{r} \text{qrs.} \\ 3 \\ 0 \end{array} \begin{array}{r} \text{sq. rods.} \\ 12 \\ 6 \\ 25 \end{array}$$

Ans. 47 0 3

$$\begin{array}{r} \text{C.} \quad \text{ft.} \\ 2 \quad 5\frac{1}{2} \\ 3 \quad 12 \\ 1 \quad 16 \\ \quad 13 \\ \hline \text{Ans. } 11 \quad 4\frac{1}{2} \end{array}$$

(5)				(6)			(7)		
hds.	bls.	gals.	qts.	yrs.	d.	h.	°	′	″
4	0	24		24	55	17	12	04	13
2	2	4	3	2	4	6	5	12	55
24					5	2		02	07
<hr/>				<hr/>			<hr/>		
Ans. 30	2	28	3	Ans. 26	65	1	Ans. 17	19	15

(8)							
8							
8							
64							
45							
320							
256	1728						
288	288						
13824							
13824							
3456							
2150.4	bu.						
4976640	(2314285						
43008	4						
67584	1.7140	pks.					
64512	8						
30720	5.712	qts.					
21504	2						
92160	1.424	pts.					
86016							
61440							
43008							
184320							
172032							
122880							
107520							
15360							

(9)			(10)		
yds.	ft.	in.			
2	2	7	27		
24			17		
7	1	6	189		
3	1	11	27 4		
<hr/>			40)459(11(2 A.		
Ans. 38	0	0	40 8		
			59 3 qrs.		
			40		
			19 sq. rods.		

A.	qrs.	sq. rods.
120	3	21
2	3	19
<hr/>		
Ans. 123	3	0

SUBTRACTION OF COMPOUND NUMBERS.

Lesson 112.

(7)				(8)				
T.	cwt.	qrs.	lbs.	lb	§	3	9	grs.
4	13	2	19	3	10	4	1	12
2	17	3	20	1	0	0	1	15
<hr/>				<hr/>				
Ans. 1	15	2	27	Ans. 2	10	3	2	17

(9)			(10)		
hrs.	min.	sec.	bu.	pks.	qts.
17	21	12	215	0	0
10	17	5	38	3	4
<hr/>			<hr/>		
Ans. 7	4	7	Ans. 176	0	4

(11)			(12)			
bls.	gals.	qts.	lbs.	oz.	pwts.	grs.
4	8	2	9	11	17	21
1	7	3	7	10	15	17
<hr/>			<hr/>			
Ans. 3	0	3	Ans. 2	1	2	04

Lesson 113.

(1)				(2)		
20				640		
2				3		
<hr/>				<hr/>		
3)40(13 cwt.	cwt.	qrs.	lbs.	A. 1920	qrs.	sq. rods.
3	13	1	9½	712	2	35
		3	17	<hr/>		
10				Ans. 1,207	1	5
9	Ans. 12	1	20½	<hr/>		
1						
4						
<hr/>						
4(1 qr.				(3)		
3				m.	fur.	rods.
				98	5	3
1				12	6	4
28				<hr/>		
28(9½ lbs.				Ans. 85	6	39
27						
1						
8						

(4)

	T.	cubic ft.	cubic in.
	7	12	
		30	1200
Ans.	6	31	528

(5)

	bu.	pkts.	qts.	pts.
	2	0	0	0
				1
Ans.	1	3	7	1

(6)

	T.	cubic ft.	cubic in.
	3	0	0
			10
Ans.	2	39	1,718

(7)

	yds.	ft.	in.
	3	0	0
			2
Ans.	2	2	10

(8)

	gals.	qts.	pts.	gi.
	17	0	0	2
			1	
Ans.	16	3	1	2

(9)

	lb.	oz.	pwts.	grs.
	1	0	0	0
				4
Ans.		11	19	20

(10)

	w.	d.	h.	min.	sec.
	2	0	0	0	10
		1			
Ans.	1	6	0	0	10

(11)

	tier.	bls.	gals.
	2	2	12
	42	31½	
	84	63	
	84		
	63		
	12		
	159		
	100		
Ans.	59		

(12)

	w.	d.	h.	min.	sec.
	7	3	16	5	28
	1	4	17	16	39
Ans.	5	5	22	48	49

(13)

	°	'	"
	89	36	0
	71	18	45
Ans.	18	17	15

(14)

bls.	gals.	qts.	pt.
185	23	2	1
123	5	0	1
Ans.	62	18	2 0

bls.	gals.
185	31.5
123	3
	4)94.5
	23.625 gals.
	4
	2.500 qts.
	2
	1.0 pts.

(15)

lbs.	oz.	pwt.	grs.
2	4	0	15
1	0	17	0
Ans.	1	3	3 15

MULTIPLICATION OF COMPOUND NUMBERS.

Lesson 114.

(6)

chal.	bu.	pks.
4	17	2
		8
Ans.	35	32 0

(7)

2	15
	90
Ans.	202° 30'

(8)

T.	cwt.	qrs.	lbs.	oz.
	4	0	27	5
				12
Ans.	2	10	3 19	12

(9)

lb.	oz.	pwt.	grs.
1	0	0	17
			28
Ans.	28	0 19	20

(10)

lb	§	3	D	grs.
2	7	2	0	17
				5
Ans.	13	0 3	1	5

17
28
136
34
24)476(19 pwts.
24
236
216
20 grs.

(11)

	m.	rods.		
	2	275		275
		37		37
Ans. 105	225	8	1925	
		40	825	
	rods in a m.	320	320)	10175 (31 m.
				960
				575
				320
				255 rods.
				2
				37
				14
				6
			Add 31 m.	
				105

(12)

A.	sq. rods.	sq. ft.	
1	4	120	120
		6	6
Ans. 6	26	175½	272.25) 720.00 (2
			54450
			175.50

(13)

C.	ft.	cubic ft.	cubic in.
5	5	0	178
			2
Ans. 11	2	0	356

(14)

hhds.	kil.	fir.
2	1	1
		3
Ans. 7	1	1

(15)

gals.	qts.	pt.	gi.
	5	1	2
			125
Ans. 179	2	1	2

(16)

w.	d.	h.	min.	sec.
	1	18	0	10
				5
Ans. 1	1	18	0	50

DIVISION OF COMPOUND NUMBERS.

Lesson 115.

$$\begin{array}{r}
 \text{(7)} \\
 \text{lbs.} \quad \text{oz.} \quad \text{pwts.} \quad \text{grs.} \\
 6 \overline{) 5} \quad 11 \quad 0 \quad 12 \\
 \hline
 \text{Ans.} \quad 11 \quad 16 \quad 18
 \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 \text{T.} \quad \text{cwt.} \quad \text{qrs.} \\
 25 \overline{) 1} \quad 5 \quad 2 \text{ (0 T.)} \\
 \underline{20} \\
 20 \\
 \underline{5} \\
 25 \text{ (1 cwt.)} \\
 \underline{25} \\
 28 \text{ (2 qrs. (0 qr.))} \\
 \underline{28} \\
 56 \text{ (2 } \frac{2}{5} \text{ lbs.)} \\
 \underline{50} \\
 \frac{6}{5}
 \end{array}$$

$$\begin{array}{r}
 \text{(11)} \\
 \text{A.} \\
 15 \overline{) 17\frac{2}{3}} \text{ (1 A.)} \\
 \underline{15} \\
 2\frac{2}{3} \\
 \underline{4} \\
 10\frac{2}{3} \text{ (0 qrs.)} \quad 3 \overline{) 80} \\
 \underline{40} \quad \underline{26.666 \&c.} \\
 400 \quad \underline{26.666 \&c. \frac{2}{3} \text{ of } 40} \\
 426.666 \text{ (28.444 \&c. sq. rods.)} \\
 \underline{30} \quad \text{[Ans.]} \\
 126 \\
 \underline{120} \\
 66 \\
 \underline{60} \\
 66 \\
 \underline{60} \\
 66 \\
 \underline{60} \\
 6
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 \frac{3}{5} \quad \frac{3}{6} \quad \frac{9}{1} \quad \text{grs.} \\
 3 \overline{) 7} \quad 6 \quad 1 \\
 \hline
 \text{Ans.} \quad 2 \quad 4 \quad 2 \quad 6\frac{2}{3}
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 \text{m.} \quad \text{r.} \\
 4 \quad 55 \\
 320 \text{ rods in a m.} \\
 \hline
 1280 \\
 \underline{55} \\
 12 \overline{) 1335} \text{ (111 } \frac{1}{2} \text{ Ans.)} \\
 \underline{12} \\
 13 \\
 \underline{12} \\
 15 \\
 \underline{12} \\
 \frac{3}{12} \text{ or } \frac{1}{4}
 \end{array}$$

$$\begin{array}{r}
 \text{(12)} \\
 \text{C.} \quad \text{ft.} \quad \text{cubic ft.} \\
 60 \overline{) 11} \quad 5 \quad 10 \text{ (0 C.)} \\
 \underline{8} \\
 88 \\
 \underline{5} \\
 93 \text{ (1 ft.)} \\
 \underline{60} \\
 33 \\
 \underline{16} \\
 198 \\
 \underline{33} \\
 10 \\
 538 \text{ (8.9 } \frac{2}{3} \text{ cubic ft.)} \\
 \underline{480} \\
 580 \\
 \underline{540} \\
 \frac{40}{18} \text{ or } \frac{2}{9}
 \end{array}$$

(13)	(14)	(15)	(16)
chal. bu. pks.	fir.	p.	
7)4 0 3(0 chal.	50)2(0 fir.	50)5(0 pipes	27)14(0°
36	9	2	60
—	—	—	—
24	)18(0 gal.	)10(0 hhds.	)840(31'
12	4	63	81
—	—	—	—
)144(20 bu.	)72(1 qt.	)630(12 gals.	
14	50	50	30
—	—	—	—
4	22	130	27
4	2	100	—
—	—	—	—
16	)44(0 pt.	30	3
3	4	4	60
—	—	—	—
)19(2½ pks.	)176(3½ gi.	)120(2 qts.	)180(6¾"
14	150	100	162
—	—	—	—
½	½	20	9)1½(¾
		2	
		)40(0 pts.	
		4	
		160(3½ gi.	
		150	
		10 or ½	

MULTIPLICATION AND DIVISION OF COMPOUND NUMBERS

BY

FRACTIONS AND MIXED NUMBERS.

Lesson 116.

(1)	(2)
T. cwt. qrs. lbs.	\$ 8¾
1 0 2 19	4
	32
3)2 1 1 10	3
	35
Ans. 13 3 3½	¾
	chal. bu. pks.
(3)	1 7 3
lbs. oz. pwts. grs.	4
8)6 2 0 10	35)4 31 0(0 chal.
	36
Ans. 9 5 1½	24
	12
	31
	)175(5 bu. Ans.
	175

70 MULTIPLICATION AND DIVISION OF COMPOUND NUMBERS.

(4)

$$\begin{array}{r}
 4\frac{1}{2} \\
 3 \\
 \hline
 12 \\
 1 \\
 \hline
 13 \\
 13 \\
 \hline
 3)11 \quad 1 \quad 2 \\
 \hline
 \text{Ans. } 3 \quad 8 \quad 3 \quad 1
 \end{array}$$

(5)

$$\begin{array}{r}
 \text{sq. rods.} \quad \text{sq. ft.} \\
 .6) 10 \quad 2.25 \\
 \hline
 \text{Ans. } 16 \quad 185.25 \\
 \hline
 272.25 \\
 .4 \\
 \hline
 108.900 \\
 2.25 \\
 \hline
 .6) 111.15 \\
 \hline
 185.25
 \end{array}$$

(6)

$$\begin{array}{r}
 \$ 24\frac{1}{2} \\
 4 \\
 \hline
 96 \\
 3 \\
 \hline
 99 \quad \text{C. ft.} \\
 22 \quad 4 \quad 9 \\
 4 \quad 4 \\
 \hline
 99)20 \quad 4(0 \text{ C.} \\
 8 \\
 \hline
 160 \\
 4 \\
 \hline
)164(1 \text{ ft.} \\
 99 \\
 \hline
 65 \\
 16 \\
 \hline
 390 \\
 65 \\
 \hline
)1040(10\frac{1}{2} \text{ cubic ft.} \\
 99 \\
 \hline
 5\frac{1}{2}
 \end{array}$$

(7)

$$\begin{array}{r}
 \text{bu. pks.} \quad \text{bu. pks. qts.} \\
 18 \quad 3 \quad \$ 12.50 \quad 7 \quad 3 \quad 2 \\
 5 \quad \text{or } \$ 2\frac{1}{2} \quad 2 \\
 \hline
 12)93 \quad 3(7 \text{ bu.} \quad 25)15 \quad 2 \quad 4(0 \text{ bu.} \\
 84 \quad 4 \\
 \hline
 9 \quad 60 \\
 4 \quad 2 \\
 \hline
 36 \quad)62(2 \text{ pks.} \\
 8 \quad 50 \\
 \hline
)39(3 \text{ pks.} \quad 12 \\
 36 \quad 8 \\
 \hline
 3 \quad 96 \\
 8 \quad 4 \\
 \hline
)24(2 \text{ qts.} \quad)100(4 \text{ qts.} \\
 24 \quad 100
 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \\
 \text{bu. pk.} \\
 2 \quad 1 \\
 4 \\
 \hline
 8 \\
 1 \\
 \hline
 9 \quad 9)5.94 \\
 \hline
 \text{Ans. \$.66}
 \end{array}$$

$$\begin{array}{r}
 \text{(5)} \\
 112 \quad 200 \\
 .04 \quad 2 \\
 \hline
 4.48 \quad 400 \\
 .10 \quad 40.00 \\
 \hline
 4.48 \quad 40.00 \\
 40. \quad 7.35 \\
 \hline
 7.35 \\
 \hline
 \text{Ans. \$ 5 1.83}
 \end{array}$$

$$\begin{array}{r}
 196 \\
 .03 \frac{1}{2} \\
 \hline
 588 \\
 49 - \frac{1}{4} \text{ of } 196 \\
 98 - \frac{1}{2} \text{ of } 196 \\
 \hline
 7.35
 \end{array}$$

$$\begin{array}{r}
 \text{(6)} \\
 1 \\
 63 \\
 \hline
 63 \\
 4 \\
 \hline
 252 \\
 2 \\
 \hline
 504) \frac{504}{1008} (\frac{1}{2} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \text{yrs. d.} \\
 19 \quad 86 \\
 17 \quad 119 \\
 \hline
 \text{Ans. 1 } 332
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 365 \\
 86 \\
 \hline
 451 \\
 119 \\
 \hline
 332 \\
 \hline
 6)180 \\
 \hline
 \text{Ans. \$ 30}
 \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 \text{A. qrs. sq. rods.} \\
 1 \quad 2 \quad 8 \\
 4 \\
 \hline
 4 \\
 2 \\
 \hline
 6 \\
 40 \\
 \hline
 240 \\
 8 \\
 \hline
 248 \\
 272 \frac{1}{2} \\
 \hline
 496 \\
 1736 \\
 496 \\
 \hline
 67456 \\
 62 - \frac{1}{4} \\
 \hline
 67518 \\
 .08 \\
 \hline
 \text{Ans. \$ 5,401.44}
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 16) \frac{48}{128} (\frac{3}{8} \text{ Ans.} \\
 48)128(2 \\
 96 \\
 \hline
 32)48(1 \\
 32 \\
 \hline
 16)32(2 \\
 32 \\
 \hline
 \end{array}$$

Lesson 119.

(1)

$$\begin{array}{r}
 6530 \\
 \underline{6} \\
 165) 39180.0 \quad (2374 \text{ (7 m.} \\
 \underline{330} \quad \underline{2240} \\
 618 \quad 134 \text{ rods.} \\
 \underline{495} \\
 1230 \\
 \underline{1155} \\
 750 \\
 \underline{660} \\
 15) \frac{20}{165} \left(\frac{8}{11} \text{ rod.}
 \end{array}$$

(3)

T. cwt. qrs.
2 7 3

$$\begin{array}{r}
 4) 3.0 \\
 \underline{20} \mid 7.75 \\
 \text{T. } 2.3875 \\
 \underline{17} \\
 167125 \\
 \underline{23875} \\
 \text{Ans. } \$40.5875 \\
 \text{or } \$40.58\frac{1}{2}
 \end{array}$$

(4)

rods. ft. in.	rods. ft.
5 12 6	2 8
165	165
<u>825</u>	<u>33.0</u>
125 ft.	8
<u>95.0</u>	<u>41.0</u>
95	
<u>41</u>	
95	
<u>380</u>	
Ans. 3895 sq. ft.	

(2)

h. min. sec.	gals. qts. pt. gi.
9 4 30	2) 27 3 1
<u>60</u>	<u>13 3 1 2</u>
540	4
<u>4</u>	<u>52</u>
544 $\frac{1}{2}$ min.	3 qts.
<u>1088 min.</u>	<u>55</u>
	2
	<u>110</u>
	1 pt.
	<u>111</u>
	4
	<u>444</u>
	2 gi.
	<u>446 gi.</u>
	1089
	<u>4014</u>
	3568
	<u>446</u>
	4) 485694 - 2 gi.
	<u>2) 121423 - 1 pt.</u>
	4) 60711 - 3 qts.
	<u>15,177 gals.</u>
(5)	24
	<u>8</u>
15) 192 (12 h.	<u>15</u>
	42
	<u>30</u>
	12
	<u>60</u>
	) 720 (48 min.
	<u>60</u>
	120
	<u>120</u>

(6)

oz. pwts. grs.
6)2 9 12(0 oz.

20
40
9

)49(8 pwts.

48
1

24

24

12

)36(6 grs.

36

(7)

T. cwt. qrs.
2 3 2

4) 2.0

2)0)3.5

T. 2.175)130.500(60

13050 [Ans.

0

(9)

lb. oz. cwt. qr. lbs.
1 4 2 1 8

16

4

16

8

4

1

20

9

28

72

18

8

260

16

156

26

2)0)416)0

Ans. 208 pieces.

3½

2

6

1

7

½

lbs.
56

oz.
13
7

2)397 11

Ans. 198 13½

(10)

ft. in.
2 6

or 2.5 ft.

4

1 0.0) 12.5

1.25 ft.

or 1 ft. 3 in. Ans.

PERCENTAGE.

Lesson 121.

<p>(2)</p> $\begin{array}{r} 950 \\ .08\frac{1}{2} \\ \hline 7600 \\ 475 \\ \hline \text{Ans. } \$80.75 \end{array}$	<p>(3)</p> $\begin{array}{r} 2507.75 \\ .20 \\ \hline \text{Ans. } \$5015500 \end{array}$	<p>(4)</p> $\begin{array}{r} 4.35 \\ 1000 \\ \hline \text{Ans. } \$4,350.00 \end{array}$																																																																																																						
<p>(5)</p> <table border="0"> <thead> <tr> <th>cwt.</th> <th>qrs.</th> <th>lbs.</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>1</td> <td>27</td> </tr> <tr> <td>5</td> <td>0</td> <td>7</td> </tr> <tr> <td>3</td> <td>3</td> <td>8</td> </tr> <tr> <td><hr/></td> <td><hr/></td> <td><hr/></td> </tr> <tr> <td>13</td> <td>1</td> <td>14</td> </tr> <tr> <td>4</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>52</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>53</td> <td></td> <td></td> </tr> <tr> <td>28</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>424</td> <td></td> <td></td> </tr> <tr> <td>106</td> <td></td> <td></td> </tr> <tr> <td>14</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>1498</td> <td></td> <td></td> </tr> <tr> <td>.18</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>11984</td> <td></td> <td></td> </tr> <tr> <td>1498</td> <td>4</td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>28)269.64</td> <td>(9</td> <td>(2 cwt.</td> </tr> <tr> <td>252</td> <td>8</td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>lbs. 17.64</td> <td>1 qr.</td> <td></td> </tr> <tr> <td>16</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>384</td> <td></td> <td></td> </tr> <tr> <td>64</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>oz. 10.24</td> <td></td> <td></td> </tr> </tbody> </table>	cwt.	qrs.	lbs.	4	1	27	5	0	7	3	3	8	<hr/>	<hr/>	<hr/>	13	1	14	4			<hr/>			52			1			<hr/>			53			28			<hr/>			424			106			14			<hr/>			1498			.18			<hr/>			11984			1498	4		<hr/>			28)269.64	(9	(2 cwt.	252	8		<hr/>			lbs. 17.64	1 qr.		16			<hr/>			384			64			<hr/>			oz. 10.24			<p>(6)</p> $\begin{array}{r} 4000)200.00 \\ 20000 \\ \hline \text{Ans. } \$2,500 \end{array}$	<p>(7)</p> $\begin{array}{r} .10)250.00 \\ \hline \text{Ans. } \$2,500 \end{array}$
cwt.	qrs.	lbs.																																																																																																						
4	1	27																																																																																																						
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COMMISSION.

$$\begin{array}{r} 1992 \text{ (9)} \\ \underline{8} \end{array}$$

$$\begin{array}{r} 2000) 8000 (.004 \\ \underline{8000} \text{ or } \frac{4}{10} \\ \text{[per cent.]} \end{array}$$

$$\begin{array}{r} 1.00 \text{ (10)} \\ \underline{.05} \\ .95) 114.00 (\text{120} \\ \underline{95} \text{ [Ans.]} \\ 190 \\ \underline{190} \\ 0 \end{array}$$

$$\begin{array}{r} 1.00 \text{ (11)} \\ \underline{.20} \\ 1.20) 75.00 (\text{62} \frac{1}{2} \text{ yds.} \\ \underline{720} \text{ [Ans.]} \\ 300 \\ \underline{240} \\ 60) \frac{60}{120} (\frac{1}{2} \end{array}$$

COMMISSION.

Lesson 122.

$$\begin{array}{r} .02 \frac{1}{2} \text{ (1)} \\ \text{or } .0225 \end{array} \quad \begin{array}{r} 3525.16 \frac{2}{3} \\ \underline{.0225} \\ 1762580 \\ 705032 \\ 705032 \\ 75 - \frac{1}{3} \\ 75 - \frac{1}{3} \\ \hline \$79.316250 \\ \text{Ans. } \$79.32 \end{array}$$

$$\begin{array}{r} 4) 30 \\ \underline{36} 35.75 (.993 \\ \underline{324} \\ 335 \\ \underline{324} \\ 110 \\ \underline{108} \\ 2 \end{array} \quad \begin{array}{r} \text{chal.} \quad \text{bu.} \quad \text{pks.} \\ 375 \quad 35 \quad 3 \\ 375.993 \\ \underline{12} \\ 751986 \\ 375993 \\ \hline 4511.916 \\ \underline{.02} \\ \$90.23832 \\ \text{Ans. } \$90.24 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 \text{A.} \quad \text{qrs. sq. rods.} \\
 117 \quad 2 \quad 4 \\
 40 \overline{) 4.0} \\
 4 \overline{) 2.1} \\
 \text{A. } 117.525 \\
 \quad 18 \\
 \quad 940200 \\
 \quad 117525 \\
 \quad 2115.450 \\
 \quad \quad .01\frac{1}{2} \\
 \quad 211545 \\
 \quad 70515 \\
 \quad 282060 \\
 2115.45 \\
 28.21 \\
 \text{Ans. } \$2,087.24
 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \\
 5000) 35.000 (.007 \\
 35000 \quad \text{or } .0\frac{7}{10} \\
 \text{[Ans.}
 \end{array}$$

$$\begin{array}{r}
 \text{(5)} \\
 .02) 253.42 \\
 \hline
 \text{Ans. } 12,671
 \end{array}$$

$$\begin{array}{r}
 100 \quad \text{(6)} \\
 .03 \quad \$ \\
 \hline
 .97) 979.70 (1010 \\
 \quad 97 \\
 \quad \quad 97 \\
 \quad \quad 97 \\
 \quad \quad \quad 0
 \end{array}$$

$$\begin{array}{r}
 \$ \\
 2525) 1010.0 (.40 \text{ Ans.} \\
 10100
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 100 \\
 .025 \\
 \hline
 1.025) 2050.000 (2000 \\
 2050 \\
 \hline
 000 \quad \$50 \text{ Ans.}
 \end{array}$$

STOCKS.

Lesson 123.

$$\begin{array}{r}
 \text{(1)} \\
 1215 \\
 \quad 100 \\
 \hline
 1215.00 \\
 \quad 23 \\
 \hline
 3645 \\
 2430 \\
 \hline
 \text{Ans. } \$2,794.50
 \end{array}$$

$$\begin{array}{r}
 \text{(2)} \\
 1.00 \\
 60) 54.0 (.90 \\
 540 \\
 \hline
 .10 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 270 \\
 \quad 500 \\
 \hline
 1350.00 \\
 \quad 500 \\
 \hline
 \text{Ans. } \$1850
 \end{array}$$

BANKRUPTCY.

<p>(4)</p> $\begin{array}{r} 250 \\ 5 \\ \hline 1250 \\ 101 \\ \hline 125 \\ 125 \\ \hline 1262.50 \\ \text{is } .0075 \quad .0075 \\ \hline 63125 \\ 88375 \\ \hline 946875 \text{ commission.} \\ 1262.50 \\ \hline 127196875 \\ \text{Ans. } \$1,271.97 \end{array}$	<p>(5)</p> $\begin{array}{r} 1.00 \\ .40 \\ \hline .60) 30.00 \text{ (50 Ans. } \$ \\ 300 \\ \hline 0 \end{array}$ <p>(6)</p> $\begin{array}{r} 1.00 \\ .12 \\ \hline 1.12) 560.00 \text{ (500 Ans. } \$ \\ 560 \\ \hline 00 \end{array}$
---	---

BANKRUPTCY.

<p>(7)</p> $\begin{array}{r} 3528) 296352 \text{ (.84 Ans.} \\ 28224 \\ \hline 14112 \\ 14112 \\ \hline \end{array}$ <p>(9)</p> $\begin{array}{r} 1800 \\ 8350 \\ 2511.16\frac{2}{3} \\ 5000 \\ \hline 17661.16\frac{2}{3}) 10596.700 \text{ (.60 Ans.} \\ 10596.700 \\ \hline 1800 \\ .60 \\ \hline \end{array}$ <p>John Smith \$1,080.00</p> $\begin{array}{r} 2511.16\frac{2}{3} \\ .60 \\ \hline 15066960 \end{array}$ <p>James Thompson \$3,000.00</p> $\begin{array}{r} 40 - \frac{2}{3} \text{ of } 60 \\ \hline \end{array}$ <p>John Williams \$1,506.7000</p>	<p>(8)</p> $\begin{array}{r} .84 \\ 100 \\ \hline \text{Ans. } \$84.00 \end{array}$ <p>(10)</p> $\begin{array}{r} .33\frac{1}{3} \\ \text{is } \frac{1}{3} \text{ } 3) 180 \\ \hline \text{Ans. } \$60 \end{array}$ $\begin{array}{r} 8350 \\ .60 \\ \hline 5000 \\ .60 \\ \hline \end{array}$
--	--

(11)

10000
5000
3828
6500

25328) 165250 (.652439
151968 [65 244 nearly
132820 [Ans.
126640
61800
50656
111440
101312
101280
75984
252960
227952
25008

.65244
10000
A. \$6,524.40000
.65244
5000
B. \$3,262.20000
.65244
3828
521952
130488
521952
195732
C. \$2,497.54032
.65244
6500
326220
391464
D. \$4,240.86000

LOSS AND GAIN.

Lesson 124.

(1)	(2)	(3)
3500	27	1.00
.10	5	.18
350.00	135	.82
Add 3500	4	873.25
Ans. \$3,850	540	82
	583.20	174650
	540	698600
	540) 43.20 (.08 Ans.	7160650
	43.20	Ans. \$7160.65

(4)	(5)	(6)	
$.33\frac{1}{3}$ is $\frac{1}{3}$	$.33\frac{1}{3}$	T. cwt.	1.00
$.25$ is $\frac{1}{4}$	$.25$	35 18	.125
\$			
3)2000 paid.	Ans. $.08\frac{1}{3}$		1.125
<u>666$\frac{2}{3}$</u>		2)0) 1|8	600
2000		35.9	35.9
			675.000 (18.80
4)2666 $\frac{2}{3}$ marked price.			359 [Ans.
<u>666$\frac{2}{3}$</u>			3160
2666 $\frac{2}{3}$			2872
<u>666$\frac{2}{3}$</u>			2880
			2872
\$ 2000 sold for.			80

(7)	(8)
750	1.00
.02	.30
<u>15.00</u>	
750	1.30
	25
765) 350.0 (.45751	65
3060 [.45 $\frac{1}{2}$ about Ans.	26

4400	32.50
3825	27.50

5750
5355

Ans. \$5.

3950
3825
1250
765
485

(9)	
1.00	
4	
<u>1.04</u>	7|00
455.000 (43|75	
416	
390	\$6.25 Ans.
312	
<u>780</u>	
728	
<u>520</u>	
520	

$$\begin{array}{r}
 \text{(10)} \\
 \begin{array}{r}
 2150 \\
 \underline{65} \\
 1075 \\
 1290 \\
 \hline
 13975 \\
 5059 \\
 7933 \\
 39. \\
 12. \\
 \underline{450} \\
 158292
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(11)} \\
 \begin{array}{r}
 1.00 \\
 \underline{.15} \\
 115) 11500.00 \\
 \underline{115} \\
 0000
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 10800 \\
 10000 \text{ cost.} \\
 \hline
 800 \\
 10000) 80000 (.08 \\
 80000 \text{ [Ans.}
 \end{array}$$

$$\begin{array}{r}
 367080 (.23190 \\
 316584 [.23190 \text{ about Ans.} \\
 \hline
 504960 \\
 474876 \\
 \hline
 300840 \\
 158292 \\
 \hline
 1425480 \\
 1424628 \\
 \hline
 8520
 \end{array}$$

DRAFT AND TARE.

Lesson 125.

(1)			(2)		
20	12		cwt.	qrs.	lbs.
2	20		5	0	23
			4	3	
128	40 draft.	240 tare.	3	3	26
20	40		13	3	21
2560	240		13	3	9
280	280		1	3	tare.
			Ans. 13	2	6
2,280 lbs. Ans.					
(3)					
112					
10					
Draft	1120				
	10	1110			
	1110	.02			
Tare	22	22.20			
Ans. 1,088 lbs.					

K

say 3 lbs.

DRAFT AND TARE.

(4)		(5)		
	112	cwt.	qrs.	lbs.
	17	7	1	6
	<u>784</u>	4		
	112	<u>28</u>		
	<u>1904</u>	1		
Draft	17	<u>29</u>		
		28		
	1887	<u>232</u>		
Tare	38	58		
	4	6	27	
28) 1849 (	66 (16 cwt.	<u>818</u>	4	
	4	27	108	
	<u>169</u>			
	168			
	<u>1</u>	5726		
1 lb.	2 qrs.	1636	21978	
		<u>22086</u>	.12	
		Draft 108	43956	
		<u>21978</u>	21978	
		Tare 2637	<u>263736</u>	
		Ans. 19,341 lbs.		

(6)		(7)		(8)	
gals.	qts.	4	217	50	
68	3	2	4	6	
60					
65	5	Ans. 8 lbs.	868	50) 440	
<u>195</u>	0	[draft.	.08		
.02			<u>69.44</u>	.88	Ans.
3.90		Ans. 69 lbs. tare.			
Ans. 4 gals.					

DUTIES.

Lesson 126.

(1)	(2)	(3)
10275	112	1637
.44	18	20
<hr/>	<hr/>	<hr/>
41100	896	Ans. \$327.40
41100	112	
<hr/>	<hr/>	
Ans. \$4521.00	2016	1998
	Draft 18	.10
	<hr/>	<hr/>
	1998	19980
	Tare 200	200
	<hr/>	<hr/>
	1798	
	.04	
	<hr/>	
	Ans. \$71.22	

(4)	(5)	(6)
130		cwt. 7
7	910	7
	.02	4
<hr/>	<hr/>	<hr/>
910		28
Leakage 18	18.20	2
<hr/>		<hr/>
892		30
.15		28
<hr/>		<hr/>
4460		840
892		6
<hr/>		<hr/>
Ans. \$133.80		846
		16
		<hr/>
		64
		<hr/>
		5076
		846
		<hr/>
		13536
		<hr/>
		Draft 64
		<hr/>
		13472
		<hr/>
		Tare 2290
		<hr/>
		11182
		.025
		<hr/>
		55910
		<hr/>
		22364
		<hr/>
		Ans. 279.550

(5)
8237
.10
<hr/>
Ans. \$823.70

13472
.17
<hr/>
94304
<hr/>
13472
<hr/>
2290.24

SIMPLE INTEREST.

(7)	(8)	(9)
275	800	112
30	.02	230
<u> </u>	<u> </u>	<u> </u>
Ans. \$ 8,250	Leakage 16 16.00	336
	784	224
	.42	<u> </u>
	<u> </u>	25760
	1568	Leakage 515
	3136	<u> </u>
	<u> </u>	25245
Ans. \$ 329.28		.04
		<u> </u>
		Ans. \$ 1,009.80

SIMPLE INTEREST.

Lesson 127.

(2)	(3)	(4)
275 0.25	275 0.25	172 3.33
.05	137.51	.05½
<u> </u>	<u> </u>	<u> </u>
137.5125	Ans. 2,887.76	861665
Ans. \$ 137.51		4308325 ¼
		8616650 ¼
		<u> </u>
		99.091475
		Ans. \$ 99.09

(5)	(6)	(7)	(8)
1800	1000	12230	1250
.06	.04½	.06	.07
<u> </u>	<u> </u>	<u> </u>	<u> </u>
108.00	4000	733.80	87.50
3	125 — ¼	5	6
<u> </u>	750 — ⅛	<u> </u>	<u> </u>
\$ 324	48.75	3660.0	\$ 525.0
Ans.]	12	12230	[Ans.
	<u> </u>	<u> </u>	
	9750	Ans. \$ 15,899	
	4875		
	<u> </u>		
	Ans. \$ 585.00		

(9)	(10)	(11)
1605.05	250	1625
.06 $\frac{1}{2}$	.06	.06
<hr/>	<hr/>	<hr/>
963030	15.00	.9750
5350166 &c. — $\frac{1}{2}$	7	2 $\frac{1}{2}$
5350166 &c. — $\frac{1}{2}$	<hr/>	<hr/>
107.0033	\$105	19500
6 $\frac{1}{2}$	[Ans.	4875 — $\frac{1}{2}$
<hr/>		<hr/>
6420198		24375
535016 — $\frac{1}{2}$		1625
<hr/>		<hr/>
6955214		186875
1605.05	Ans. \$ 18.69	
<hr/>		
Ans. \$2300.57		

Lesson 128.

(2)
31
20
<hr/>
11 days in Jan.
12 days in Feb.
<hr/>
23
1200 in. for 1 year.
7.56
<hr/>
Ans. \$ 127.56
<hr/>
365) 2760 (7.56
2555
<hr/>
2050
1825
<hr/>
2250
2190
<hr/>
600

SIMPLE INTEREST.

(3)			(4)			21	
	243		1800			7	
	1	17	.06			31	—
11650	—	4	—			14	14
.07	244	—	108.00		108	—	
—	13	13	4		45	45	
81550	—		—		—		
231	231		432		540		
—			1332		482		
8155			—		—		
24465			445.32	365	4860	(13.315	
16310			1800		365		
365)1883805	\$ (5.16 Ans.		—		—		
1825			\$2245.32		1210		
—			[Ans.		1095		
588					—		
365					1150		
—					1095		
2230					—		
2190					550		
—					365		
400					—		
					1850		
					1825		
					—		
					25		

(5)		
605.25		
.06 $\frac{1}{2}$		
—		
363150		
1513125 — $\frac{1}{4}$		
3026250 — $\frac{1}{4}$		
—		
40.854375 in. for 1 yr.	40.85	
2.238	20	
—	—	
43.092	365)817.00	(2.238
Ans. \$43.09	730	
	—	
	870	
	730	
	—	
	1400	
	1095	
	—	
	3050	
	2920	
	—	
	130	

$$\begin{array}{r}
 1000 \\
 .07 \\
 \hline
 70.00 \\
 2 \\
 \hline
 140
 \end{array}
 \begin{array}{r}
 (6) \\
 70 \\
 10 \\
 \hline
 80 \\
 365) 700 (1917 \\
 365 \\
 \hline
 3350 \\
 3285 \\
 \hline
 650 \\
 365 \\
 \hline
 2850 \\
 2555 \\
 \hline
 295
 \end{array}$$

\$14192 Ans.

$$\begin{array}{r}
 (7) \\
 2800 \\
 .05\frac{1}{2} \\
 \hline
 140.00 \\
 93333 \&c. \frac{1}{2} \\
 93333 \&c. \frac{1}{2} \\
 \hline
 158.6666 \&c. \\
 303 \\
 \hline
 4759999 \\
 4759999 \\
 365) 48075.9899 (131.715 \\
 365 \\
 \hline
 1157 \\
 1095 \\
 \hline
 625
 \end{array}
 \begin{array}{r}
 2800 \\
 131.72 \\
 \hline
 2931.72 \\
 625 \text{ Ans. } \$2931.72 \\
 365 \\
 \hline
 2609 \\
 2555 \\
 \hline
 548 \\
 365 \\
 \hline
 1839 \\
 1825 \\
 \hline
 14
 \end{array}$$

$$\begin{array}{r}
 7130 \\
 .06 \\
 \hline
 4278 \\
 6 \text{ yrs.} \\
 \hline
 25.668 \\
 2.719 \\
 \hline
 28.387 \\
 \$28.39 \text{ Ans.}
 \end{array}
 \begin{array}{r}
 (8) \\
 248 \\
 11 \\
 \hline
 4278 \\
 232 \\
 \hline
 8556 \\
 12834 \\
 \hline
 8556 \\
 365) 992.496 (2.719 \\
 730 \\
 \hline
 2624 \\
 2555 \\
 \hline
 699 \\
 365 \\
 \hline
 3346 \\
 3285 \\
 \hline
 61
 \end{array}$$

$$\begin{array}{r}
 (9) \\
 2500.50 \\
 .10 \\
 \hline
 2500.500 \\
 28 \\
 \hline
 200040 \\
 50010 \\
 \hline
 700140 \\
 365) 700140 (19.18 \\
 365 \\
 \hline
 3351 \\
 3285 \\
 \hline
 664 \\
 365 \\
 \hline
 2990 \\
 2920 \\
 \hline
 70
 \end{array}$$

(10)		(11)		12
5000			245	$\frac{1}{11}$
.06	211	800	11	
<u>300.00</u>	300	.07	<u>256</u>	
365)63300(173.42		<u>56.00</u>	56	
365	5000	7 yrs.	<u>1536</u>	
2680	173.42	392	1280	
2555		39.28	365)14336(39.276	
<u>1250</u>	\$5,173.42	\$431.28	1095	
1095	[Ans.]	[Ans.]	<u>3386</u>	
<u>1550</u>			3285	
1460			<u>1010</u>	
<u>900</u>			730	
730			<u>2800</u>	
<u>1700</u>			2555	
			<u>2450</u>	
			2190	
			<u>260</u>	

Lesson 129.

(2)	(3)		
850.25	75.50		
.05	.08		
<u>8 mo. 425125</u>	12) 6040	(.5033	.5033
or $\frac{2}{3}$ yr. <u>2</u>	60	4 mo.	12 d.
3) 850250	<u>40</u>	<u>2.0132</u>	<u>10066</u>
283416	36	201	5033
Ans. \$28.34	<u>40</u>	<u>2.214</u>	30) <u>60396</u>
	36	\$2.21	<u>.20132</u>
	<u>4</u>	[Ans.]	

(4)

			31
			<u>22</u>
1738			1
.06			<u>1</u>
<u>104.28</u>	12) 104.28	(8.69	2 mo. 15 d.
5 yrs.	96	2 $\frac{1}{2}$	or 2 $\frac{1}{2}$ mo.
<u>521.40</u>	<u>82</u>	<u>17.38</u>	
21.72 $\frac{1}{2}$	72	4345 - $\frac{1}{2}$	
Ans. \$543.12 $\frac{1}{2}$	<u>108</u>	<u>21.725</u>	
	108		

(5)			(6)	
		31	15 00	
		20	.025	
		<hr/>		
100	1	11	75	
.02	1	4	30	
<hr/>				
2.00	2 mo. 15 d.		37.5 00	375
2½	or 2½ mo.		5 mo.	18
<hr/>				
4			187.5	3000
1			22.5	375
<hr/>			1500.	
Ans. \$5				
		Ans. \$1,710.0	30) 675.0	
			<hr/>	
			22.5	

(7)	(8)	(9)
2000	500	150
.06	.01	.10
<hr/>	<hr/>	<hr/>
4) 120.00	5.00	12) 15.00 (1.25
<hr/>	2½	12
Ans. \$30	10	30
	1.666 &c. — ⅓	24
	<hr/>	<hr/>
	11.666	60
	500	60
	<hr/>	
	511.666	
	or \$511.66⅔ Ans.	

(10)		
18.25		
.08		
<hr/>		
1.4600	12) 1.46 (	.1216
2 yrs.	12	2.1
<hr/>	26	1216
2.92	24	2432
.25536	<hr/>	20.25536
3.17536	12	
Ans. \$3.18	<hr/>	
	80	

Lesson 130.

(1)

	yr.	mo.	d.
55.20	1	7	12
1.61 $\frac{2}{3}$			
<hr/> 552			30) 12.0
3312			12) 7.4 (.6166 &c.
552			72 or .61 $\frac{2}{3}$
<hr/> 88.872			<hr/> 1.61 $\frac{2}{3}$ yr.
184 — $\frac{1}{3}$			20
184 — $\frac{1}{3}$			12
<hr/> 89.240			<hr/> 80
5.35000 (.06 nearly Ans.			72
535440			<hr/> 8

(2)

1 yr. 91 d.

365) 91.0 (.2493	1.2493 yr.	
730	150	
<hr/> 1800	<hr/> 62465	163.125
1460	12493	150
<hr/> 3400	1873950	187395) 1312500 (.07
3285		1311765 [Ans.
<hr/> 1150		<hr/> 735
1095		
<hr/> 55		

(3)

25153125	2615375	
.06	25153125	
<hr/> 150.918750	<hr/> 100.062500	.6630 yr. 663
150.91875) 90551250		365
	<hr/> 95112500	3315
	90551250	3978
	<hr/> 45612500	1989
	45275625	241.995
	<hr/> 3368750	Ans. 242 d.

(4)

87
.06

52.2) 1750 (33524 yrs. 3524
 1566 365

(5)

yrs. d.
 2 17

365
2

730
17

747

Multiply $\frac{747}{365}$ yrs. by .07

747
.07

52.29
 $\frac{52.29}{365}$

Dividing
 37.25 by $\frac{52.29}{365}$
 365

18625
 22350
11175

52.29) 13596.25 (260.016
 10458 \$260.02 Ans.

31382
31374

8500
5229

32710
31374

1336

SIMPLE INTEREST.

(7)

$\frac{1}{.05}$		$1\frac{105}{365}$ yr.
$\frac{.05}{.05}$		$\frac{105}{.05}$
$\frac{1\frac{105}{365}}{.05}$		$365) 5.25 (.01438$
$\frac{.01438}{.01438}$		$\frac{365}{1600}$
$\$1.06438$ amount of \$1.		$\frac{1460}{1400}$
$1.06438) 100.00000$	$\$$	$\frac{1400}{1095}$
957942	$(93.95 \text{ Ans.}$	$\frac{3050}{2920}$
420580		$\frac{130}{149900}$
319314		
1012660		
957942		
547180		
532190		
149900		

(8)

$\frac{1}{.07}$		
$\frac{.07}{.07}$	yrs. mo.	
$\frac{4\frac{1}{4}}{.28}$	4 3	
$\frac{175 - \frac{1}{4}}{12975}$	or $4\frac{1}{4}$ yrs.	
$12975) 25.125$	$(19.364$	$\$19.36 \text{ Ans.}$
12975		
121500		
116775		
47250		
38925		
83250		
77850		
54000		
51900		

(9)

			153	26
			21	5
			<hr/>	
	yr. d.		174	21
$1\frac{174}{365}$	1 174			
.06	or $1\frac{174}{365}$ yr.		174	
			.06	
.06				
.0286	— $\frac{174}{365}$ of .06	365)	1044	(.0286
			730	
1.0886	amount of \$ 1		3140	
			2920	
			<hr/>	
			2200	
			2190	
			<hr/>	
			10	

1.0886) 250.0000 \$
 21772 (229.65 Ans. (10)

32280
 21772

105080
 97974

71060
 65316

57440
 54430

3010

.06
 1.06) 1000 (9.433 Ans.
 954
 460
 424
 360
 318
 420
 318
 102

Lesson 131.

(2)

61 12
 10 2
 yrs. d.
 2 51 51 10
 or $2\frac{51}{365}$ yrs. time to 1st payment.

183 14
 2 12
 yrs. d.
 2 185 185 2
 or $2\frac{185}{365}$ yrs. time to 2nd payment.

90 14
 13 1
 d.
 77 77 13
 or $\frac{77}{365}$ yr. time from 2nd to 3d payment.

yrs. d.
 2 122
 or $2\frac{122}{365}$ yrs. time from 3d payment to July 1st, 1825.
 (Carried over.)

SIMPLE INTEREST.

(Brought over.)

5255.50			
.06			
<u>315330</u>			315.33
2			185
630.66	in. for 2 yrs.; more than 1st payment.		157665
			252264
			31533
630.66	600		
159.82	1000		
		365)	58336.05 (159.824
790.48	1600		365
	790.48		
5255.50			2183
809.52			1825
	809.52 excess.		
4445.98	1st rem.		3586
.06			3285
<u>2667588</u>			3010
77			2920
18673116			
18673116			905
			730
	2260.37		
365)20540.4276(56.275	56.28		1750
1825			1460
	2204.09 excess.		290
2290			
2190			
	4445.98 1st rem.		
1004	2204.09		
730			
	2241.89 2nd rem.		1345134
2742	.06		122
2555			
	1345134		2690268
1877		2122 yrs.	2690268
1825	2690268		1345134
	4496		
		365)	16410.6348 (44.96
			1460
	313.99		
	2241.89		1810
			1460
	\$2555.88 Ans.		3506
			3285
			2213
			2190
			230

SIMPLE INTEREST.

(Brought over.)

452.43	1st rem.	218337
140.52		261
<hr/>		<hr/>
311.91	2nd rem.	218337
.07		1310022
<hr/>		<hr/>
218337		436674
15.6125	365)	5698.5957 (15.6125
<hr/>		<hr/>
37.4462		365
311.91		2048
<hr/>		<hr/>
Ans. \$349.36		1825
		<hr/>
		2235
		2190
		<hr/>
		459
		365
		<hr/>
		945
		730
		<hr/>
		2150
		1825
		<hr/>
		325

(4)

	304	13
	12	1
d.	<hr/>	<hr/>
292	292	12
or $\frac{3\frac{2}{5}}{365}$ yr. time to 3d payment. The interest to the 1st payment is plainly more than \$3, and the interest to the 2nd payment is plainly more than \$8.		

	30	29
	28	1
d.	<hr/>	<hr/>
58	58	28
or $\frac{1\frac{3}{5}}{365}$ yr. time from 3d payment to July 29th, 1829.		

(Carried over.)

210.14			
.06			
<hr/>			
12.6084			
292			
<hr/>			
252168	3		
1134756	5		
252168	180.25		
<hr/>	<hr/>		
365) 3681.6528 (10.086	188.25		
365 [or 10.09	10.09		
<hr/>	<hr/>		
3165	178.16 excess.	210.14	
2920		178.16	
<hr/>		<hr/>	
2452		31.98 rem.	
2190		.06	
<hr/>		<hr/>	
262		19188	
		58	
		<hr/>	
		153504	
		95940	
		<hr/>	
	31.98	365) 111.2904 (.304	
	.30	1095	
	<hr/>	<hr/>	
Ans. \$32.28		1790	
		1460	
		<hr/>	
		330	

(5)

600			
.06			
12) 36.00 (3	100		
36	3		
	97 excess.	600	
		97	
		503 1st rem.	
		.06	
		12) 30.18 (2.515	
		24	
		<hr/>	
		61	
		60	
		<hr/>	
		18	
		12	
		<hr/>	
		60	
		60	
		100	
		2.515	
		97.485 excess.	
		(Carried over.)	

(C)

	153	13	25.50	
	10	3	.06	
d.	<u> </u>	<u> </u>	<u>1536</u>	
163	163	10	163	
or $\frac{182}{365}$ yr. time to 1st payment.			<u>459</u>	
	31	13	918	
	12	1	153	
d.	<u> </u>	<u> </u>	<u>24939</u>	18.12
19	19	12	2190	68
or $\frac{12}{365}$ yr. time from 1st payment			<u>3039</u>	17.44
to 2d payment,			<u>2920</u>	[excess.
d.			<u>1190</u>	
151			<u>1095</u>	
or $\frac{141}{365}$ yr. time from 2d payment.			<u>95</u>	
to July 1st, 1836.				
	25.50			
	<u>17.44</u>			
	8.06 1st rem.			
	<u>.06</u>			
	.4836			
	<u>19</u>			
	43524			
	<u>4836</u>			
365) 9.1884 (.025	2.00			
730 or .03	<u>.03</u>			
	1888	1.97 excess.	8.06	
	<u>1825</u>		<u>197</u>	
634			6.09 2d rem.	
			<u>.06</u>	
			.3654	
			<u>151</u>	
			3654	
			18270	
			<u>3654</u>	
			365) 55.1754 (.15	6.09
			<u>365</u>	.15
			1867	
			<u>1825</u>	
			415	Ans. \$ 6.24

Lesson 133.

(1)

	334	29	210.14
	16	13	.06
d.	350	16	126084
or $\frac{344}{365}$ yr. time the principal runs.	212	29	350
	17	12	630420
d.	229	17	378252
or $\frac{222}{365}$ yr. time 1st payment runs.	61	29	365) 44129400 (1209
	27	2	365
d.	88	27	210.14
or $\frac{82}{365}$ yr. time 2d payment runs.	30	29	762
	28	1	730
d.	58	28	222.23
or $\frac{42}{365}$ yr. time 3d payment runs.	229	88	3294 [am. of prin.
	3	5	3285
	687	440	90
		180.25	
		58	
		144200	
		90125	
		10454.50	
		687	
		440	
		11581.50	
		.06	
	365) 694.890 (1903		
	365	3	
	3298	5	
	3285	180.25	
		1.90	
		222.23	
		190.15 amounts	190.15
		[of payments.	
		Ans. \$32.08	
		1390	
		1095	
		295	

(2)

600	100					
.06	.06					
<u>2) 36.00</u>	<u>12) 6.00</u>	.50	.50	.50		
18	60	5	4	3	2	
600		2.50	2.00	1.50	1.00	.50
<u>618 amount of</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
[prin.	102.50	102.00	101.50	101.00	100.50	
	102.50					
	102.00					
	101.50					
	101.00					
	100.50					
618						
<u>507.50</u>	507.50	amounts of payments.				
Ans. \$110.50						

(3)

	334		25.50		
	1	3	.06		
	<u>335</u>	<u>1</u>	<u>1.530</u>		
	2	2	333		
d.	<u>333</u>		<u>459</u>		
or $\frac{333}{365}$ yr. time the principal runs.	333		459		
	181		459		
	1	13	365) 509.49	(1.395	25.50
	<u>182</u>	<u>1</u>	365	[or 1.40	1.40
	12	12	1444		26.90
d.	<u>170</u>		<u>1095</u>	[amount of prin.	
or $\frac{170}{365}$ yr. time 1st payment runs.	170		3499		
	150		3285		
	1				
d.	<u>151</u>		<u>2140</u>		
or $\frac{151}{365}$ yr. time 2d payment runs.	151		1825		
			315		

(Carried over.)

(Brought over.)

18.12			
170			
<hr/>			
12684	151		
1812	2		
<hr/>	<hr/>		
3080.40	302		
3080.40			
302			
<hr/>			
3382.40			
.06			
<hr/>			
365) 2029.44 (.556	18.12		
1825 [or .56	2.00		
	.56		
<hr/>	<hr/>		
2044	20.68	amounts of	26.90
1825	[payments.		20.68
<hr/>			<hr/>
2194			Ans. \$6.22
2190			
<hr/>			
4			

(4)

d.				214	2
306				1	1
or $\frac{306}{365}$ yr. time the 1st Dr. item				d.	
[runs.				213	1
245 5				or $\frac{213}{365}$ yr. time the 1st Cr. item	
4 1				[runs.	
d.				153	12
241	241	4		11	1
or $\frac{241}{365}$ yr. time the 2nd Dr. item				d.	
[runs.				142	11
122 8				or $\frac{142}{365}$ yr. time the 2nd Cr. item	
7 1				[runs.	
d.				31	20
115	115	7		19	1
or $\frac{115}{365}$ yr. time the 3d Dr. item				d.	
[runs.				12	19
				or $\frac{12}{365}$ yr. time the 3d Cr. item	
				[runs.	

(Carried over.)

(Brought over.)		
306	241	115
200	50	130
<u>61200</u>	<u>12050</u>	<u>345</u>
61200		115
12050		<u>14950</u>
14950		
<u>88200</u>		
.06	200	
	50	
365) 5292.00 (14.498	130	
365 [or 14.50	<u>14.50</u>	
1642	394.50 amount of Dr. side.	
<u>1460</u>		
1820		
<u>1460</u>		
3600		
<u>3285</u>		
3150		
<u>2920</u>		
230		
213	142	125
100	85	12
<u>21300</u>	<u>710</u>	<u>250</u>
21300	1136	125
12070	<u>12070</u>	<u>1500</u>
1500		
<u>34870</u>	100	
.06	85	
365) 2092.20 (5.73	125	
1825	<u>5.73</u>	
2672	315.73 amount of Cr. side.	
<u>2555</u>	394.50	
1170	<u>31573</u>	
<u>1045</u>		
75	Ans. \$78.77 due David Sibley.	

(5)

	181	21		304	11
	10	11		1	10
d.	<u>171</u>	<u>10</u>	d.	<u>305</u>	<u>1</u>
or $\frac{171}{365}$ yr. time the 1st Dr. item	171	10	or $\frac{305}{365}$ yr. time the 1st Cr. item	305	1
		[runs.		212	18
d.				7	11
61			d.	<u>205</u>	<u>7</u>
or $\frac{61}{365}$ yr. time the 2nd Dr. item		[runs.	or $\frac{205}{365}$ yr. time the 2d Cr. item	205	7
	31	11			[runs.
	5	6		181	11
d.	<u>36</u>	<u>5</u>		5	6
or $\frac{36}{365}$ yr. time the 3d Dr. item	36	5	d.	<u>186</u>	<u>5</u>
		[runs.	or $\frac{186}{365}$ yr. time the 3d Cr. item	186	5
			d.		[runs.
			122		
			or $\frac{122}{365}$ yr. time the 4th Cr. item		[runs.

	171	61	175
	75	200	36
	<u>855</u>	<u>12200</u>	<u>1050</u>
1197			525
<u>12825</u>			<u>6300</u>
12825			
12200			
6300			
<u>31325</u>			
.07			
365) 2192.75 (6.007		75	
2190 [or 6.01		200	
		175	
		6.01	
		<u>45601</u>	
2750			45601 amount of Dr. side.
2555			
<u>195</u>			

(Carried over.)

(Brought over.)			
305	205	186	122
250	75	60	100
<u>1525</u>	<u>1025</u>	<u>11160</u>	<u>12200</u>
610	1435		
<u>76250</u>	<u>15375</u>		
76250			
15375			
11160			
12200			
<u>114985</u>		250	
.07		75	
		60	
		100	
365) 8048.95 (22.05		22.05	
730			
<u>748</u>		507.05	amount of Cr. side.
730		507.05	
<u>1895</u>		456.01	
1825	Ans. \$51.04 due R. Leach.		
<u>700</u>			

(6)			
181	2		
1	1		
d.			
180	180	180	29
or $\frac{180}{365}$ yr. time 1st Dr. item runs.	30	40	100
	1	7200	2900
d.		7200	
29	29	2900	
or $\frac{29}{365}$ yr. time 2nd Dr. item runs.	150	10100	
	11	.05	40
d.		365) 505.00 (1.383	100
139	139	365	or 1.38
or $\frac{139}{365}$ yr. time 1st Cr. item runs.	1400		14138
d.	1095		amount of
122	3050		Dr. side.
or $\frac{122}{365}$ yr. time 2nd Cr. item runs.	2920		
	61	1300	
	3	1095	
d.		205	
58	58		
or $\frac{58}{365}$ yr. time 3d Cr. item runs.	3		

(Carried over.)

COMPOUND INTEREST.

(Brought over.)

139	122	58
50	60	20
<u>6950</u>	<u>7320</u>	<u>1160</u>
6950		
7320		
1160		
<u>15430</u>		
.05		50
365) 771.50	(2.113	60
730	or \$2.11	20
<u>415</u>		<u>2.11</u>
365		132.11 amount of Cr. side.
<u>500</u>		
365		141.38
<u>1350</u>		<u>13211</u>
1095		Ans. \$9.27 due James Colburn.
<u>255</u>		

COMPOUND INTEREST.

Lesson 133.

(2)

255.167
1.06
<u>1531002</u>
255167
270.47702 amount for 1 yr.
1.06
<u>162286212</u>
27047702
286.7056412 amount for 2 yrs.
1.06
<u>17202338472</u>
2867056412
303.908979672 amount for 3 yrs.
1.06
<u>1823453878032</u>
303908979672
322.14351845232 amount for 4 yrs.
(Carried over.)

(Brought over.)

322.14351845232 amount for 4 yrs.
1.06

193286111071392
32214351845232

341.4721295594592 am. for 5 yrs. 341.472
5.122 .06

346.594 4) 20.48832
5.122

Ans. \$346.59

(3)

365
40 4).07
90) 405 (4 $\frac{1}{2}$ quarters. .0175 for 90 d. or 1 quarter.

360
45) 36 ($\frac{1}{2}$ 1.0175
1000

1017.5000 amount for 1 qr.

1.0175

50875

71225

10175

10175

1035.30625 amount for 2 qrs.

1.0175

517653125

724714375

103530625

103530625

1053.424109375 amount for 3 qrs.

1.0175

5267120

7373968

1053424

1053424

1071.8589200 amount for 4 qrs.

9.37876

1081.23778

Ans. \$1,081.24

1071.8589

.0175

53592945

75030123

10718589

2) 18.75753075

9.378765 in. for
[$\frac{1}{2}$ quarter.

COMPOUND INTEREST.

(4)

1843.125
1.06

11058750
1843125

195371250 amount for 1 yr.
1.06

117222750
19537125

2070935250 amount for 2 yrs.
1.06

1242561150
207093525

2195.1913650 amount for 3 yrs.
1.06

13171148190
2195191365

232690284690 amount for 4 yrs.
1.06

139614170814
23269028469

2466517017714 amount for 5 yrs.
1.06

14799102
2466517

261450802 amount for 6 yrs.

Ans. \$2,614.51

(5)

365	
<u>3</u>	4).06
90) 1095 (12 $\frac{1}{2}$ quarters.	.015 for 90 d. or 1 quarter.
90	1.015
<u>195</u>	1200
180	
<u>15) $\frac{1}{10}$ ($\frac{1}{10}$</u>	2030
	1015
	<u>1218.000</u> amount for 1 qr.
	1.015
	<u>6090</u>
	1218
	1218
	<u>1236.270</u> amount for 2 qrs.
	1.015
	<u>618135</u>
	123627
	123627
	<u>1254.81405</u> amount for 3 qrs.
	1.015
	<u>627407025</u>
	125481405
	125481405
	<u>1273.63626075</u> amount for 4 qrs.
	1.015
	<u>636818130</u>
	127363626
	127363626
	<u>1292.74080390</u> amount for 5 qrs.
	1.015
	<u>64637040</u>
	12927408
	12927408
	<u>1312.1319120</u> amount for 6 qrs.
	(Carried over.)

COMPOUND INTEREST.

(Brought over.)

1312.1319120 am. for 6 qrs.
1.015

6560659560
1312131912
1312131912

1331.813890680 am. for 7 qrs.
1.015

665906945
133181389
133181389

1351.79109835 amount for 8 qrs.
1.015

6758955490
1351791098
1351791098

1372.067964470 amount for 9 qrs.
1.015

686033982235
137206796447
137206796447

1392.64898393705 amount for 10 qrs.
1.015

696324490
139264898
139264898

1413.53871470 amount for 11 qrs. 1434.74178
1.015 .015

70676935 717370890
14135387 148474178
14135387

1434.7417805 amount for 12 qrs. 6) 2152112670
358685445 In. for $\frac{1}{2}$ qr. 358685445

1438.32863495
1200

\$238.33 Ans.

$$\begin{array}{r}
 \textcircled{6} \\
 7.612255 \\
 \underline{50} \\
 380.612750 \\
 \underline{50} \\
 \text{Ans. } \$330.61
 \end{array}$$

$$\begin{array}{r}
 \textcircled{7} \\
 3.0256 \\
 \underline{216} \\
 181536 \\
 \underline{30256} \\
 60512 \\
 \underline{6535296} \\
 216
 \end{array}$$

Ans. \$437.53

$$\begin{array}{r}
 \textcircled{8} \\
 4.116136 \\
 \underline{18} \\
 32929088 \\
 4116136 \\
 \underline{74090448} \\
 .926 \\
 75.016 \\
 \text{Ans. } \$75.02
 \end{array}$$

$$\begin{array}{r}
 74.09 \\
 .05 \\
 \underline{4) 3.7045} \\
 .926
 \end{array}$$

$$\begin{array}{r}
 \textcircled{9} \\
 9.703507 \\
 \underline{11} \\
 9703507 \\
 \underline{9703507} \\
 106.738577 \\
 \text{Ans. } \$106.74
 \end{array}$$

$$\begin{array}{r}
 \textcircled{10} \\
 2.012196 \\
 \underline{20\frac{1}{2}} \\
 40243920 \\
 503049-\frac{1}{2}
 \end{array}$$

$$\begin{array}{r}
 40.746969 \text{ for 12 yrs.} \\
 .407468 \text{ for 2 mo.} \\
 .095 \text{ for 14 d.}
 \end{array}$$

$$\begin{array}{r}
 40.746969 \\
 \underline{.407468} \\
 41.249437
 \end{array}$$

$$\begin{array}{r}
 41.25 \\
 \underline{20.25} \\
 \$21 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 12) 2.44481814 \\
 \underline{24} \\
 44 \\
 \underline{36} \\
 88 \\
 \underline{84} \\
 41 \\
 \underline{36} \\
 58 \\
 \underline{48}
 \end{array}$$

$$\begin{array}{r}
 .203734 \\
 \underline{.2037} \\
 .407468 \\
 \underline{.2037} \\
 30) 2.8518 \\
 \underline{.0950}
 \end{array}$$

DISCOUNT.

Lesson 134.

(1)	(2)	(3)
195	17.50	\$.07 interest of \$1 for 1 yr.
23	.12	1.
<u>Ans. \$172</u>	<u>350</u>	<u>1.07</u> 500.00 (467.289
	175	428 \$467.29
	<u>2.100</u>	<u>2.10</u>
	Ans. \$15.40	Ans.
(4)		720
467.29		642
.07		<u>780</u>
<u>327.103</u>		749
Add 467.29		<u>310</u>
<u>Ans. \$500.00</u>		214
		<u>960</u>
		856
		<u>1040</u>
		963
		<u>77</u>
(5)	(6)	
\$.06 in. of \$1 for 1 yr.	2) .06	
4) .06	<u>.03</u>	
.015	1.	
3	<u>1.03</u> 1850.375 (1796.48	
.045 in. of \$1 for 9 mos.	103	
1.	<u>820</u>	1850.375
1.045) 385.000 (368.42	721	1796.48
3135 [Ans.	<u>993</u>	538.95
	927	Ans. \$53.90
<u>7150</u>	<u>667</u>	
6270	618	
<u>8800</u>	<u>495</u>	
8360	412	
<u>4400</u>	<u>830</u>	
4180	824	
<u>2200</u>	<u>6</u>	
2090		
<u>110</u>		

DISCOUNT.

(Brought over.)

6) .07

<u>25</u>				<u>.011666</u>	
<u>.07</u>				<u>1.</u>	
12) <u>175</u> (.1458	25.1458	10.11666	40.000000	(39.5387	
12			3034998		
<u>55</u>			<u>9650020</u>		
<u>48</u>			<u>9104994</u>		
<u>70</u>			<u>5450260</u>		
<u>60</u>			<u>5058330</u>		
<u>100</u>			<u>3919300</u>		
<u>96</u>			<u>3034998</u>		
<u>4</u>					
	81.8666				
	16.1866			8843020	
	25.1458			8093328	
	39.5387				
	<u>162.7377</u>			<u>7496920</u>	
				<u>7081662</u>	
	Ans. \$162.74				

	(9)	\$		(10)	
1.157625)	9261.000000	(8,000		500	500
	9261000	[Ans.	.07		35
	<u>000</u>		<u>35.00</u>	Ans. \$465	

		(11)			
<u>80</u>	<u>16</u>	<u>25</u>			
<u>.07</u>	<u>.07</u>	<u>.07</u>			
3) <u>5.60</u>	6) <u>1.12</u>	12) <u>1.75</u> (.1458	25.1458		
<u>18666</u>	<u>.18666</u>	<u>12</u>			
<u>80</u>	<u>16</u>	<u>55</u>	<u>40</u>		
<u>81.8666</u>	<u>16.18666</u>	<u>48</u>	<u>.07</u>		
		<u>70</u>	<u>6) 2.80</u>		
81.8666		<u>60</u>	<u>.4666</u>	40.	
16.1866		<u>100</u>	<u>.4666</u>	<u>39.5333</u>	
25.1458		<u>96</u>			
39.5333		<u>4</u>			
<u>162.7323</u>					
\$162.73 Ans.					

DISCOUNT.

115

(12)

			62	20
			16	4
			<hr/>	<hr/>
\$ 475 due Sept. 4th.	July 20th to Sept. 4th,		46 d.	16
			153	21
			1	20
			<hr/>	<hr/>
\$ 320 due Dec. 21st.	July 20th to Dec. 21st,		154 d.	1
\$ 100 due Dec. 30th.	July 20th to Dec. 30th,		163 d.	
			92	21
			1	20
			<hr/>	<hr/>
\$ 287 due Oct. 21st.	July 20th to Oct. 21st,		93 d.	1
\$ 300 on in. from July 12th to July 20th,			8 d.	
475	154	163	287	
46	320	100	93	
<hr/>	<hr/>	<hr/>	<hr/>	
2850	308	16300	861	
1900	462		2583	
<hr/>	<hr/>		<hr/>	
21850	49280		26691	287
			.06	300
			<hr/>	<hr/>
21850				587
49280		365)1601.46(4.387		4.39
16300	475	1460		
<hr/>	320	<hr/>		582.61
87430	100	1414		.39
.06		1095		<hr/>
<hr/>	895	<hr/>		583.00
365)5245.80(14.37	14.37	3196		
365		2920		
<hr/>	880.63	<hr/>		
1595	583.	2760		
1460	<hr/>	2555		
<hr/>	Ans. \$ 297.63			300
1358				.06
1095				<hr/>
<hr/>				18.00
2630				8
2555				<hr/>
<hr/>				365)1440(.394
75				1095
				<hr/>
				3450
				3285
				<hr/>
				1650
				1460

BANKING.

Lesson 135.

<p>(1)</p> $\begin{array}{r} 683 \\ .06 \\ \hline 6) 40.98 \\ \hline 683 \\ .34 \\ \hline 7.17 \end{array}$ <p>3 days are $\frac{3}{80}$ or $\frac{1}{26}$ of 60 d.</p> $\begin{array}{r} 2|0) 6.83 \\ \hline .34 \end{array}$ <p>683 7.17 7.17</p> <p>Ans. \$675.83</p>	<p>(2)</p> $\begin{array}{r} 3327.40 \\ .07 \\ \hline 4) 2329.180 \\ \hline 582295 \\ 194 \\ \hline \end{array}$ <p>3 days are $\frac{3}{80}$ or $\frac{1}{26}$ of 90 d.</p> $\begin{array}{r} 3|0) 582295 \\ \hline 194 \end{array}$ <p>Ans. \$60.17</p>
---	---

<p>(3)</p> $\begin{array}{r} 5|0) 1000|0 \\ \hline 200 \text{ bales.} \\ 60 \\ \hline 12000 \\ .06 \\ \hline 4) 720.00 \\ \hline 180 \\ 6 \\ \hline 186 \end{array}$ <p>3|0) 18|0</p> $\begin{array}{r} 6 \\ \hline 12000 \\ 186 \\ \hline 11814 \\ 10000 \\ \hline \end{array}$ <p>Ans. \$1,814</p>	<p>(4)</p> $\begin{array}{r} 982 \\ .07 \\ \hline 68.74 \\ 73 \text{ days.} \\ \hline 20622 \\ 48118 \\ \hline 36|0) 5018.02 (13.938 \\ 36 \\ \hline 141 \\ 108 \\ \hline 338 \\ 324 \\ \hline 140 \\ 108 \\ \hline 322 \\ 288 \\ \hline 34 \end{array}$ <p>982 13.94</p> <p>\$968.06 [Ans.]</p>
--	--

<p style="text-align: center;">(5)</p> $\begin{array}{r} 2500 \\ .06 \\ \hline 3) 150.00 \\ \hline 50 \\ 1.25 \\ \hline \end{array}$ <p>3 d. are $\frac{3}{10}$ or $\frac{1}{10}$ of 120 d.</p> $\begin{array}{r} 40) 50 \\ \hline 1.25 \end{array}$ <p>Ans. \$ 51.25</p>	<p style="text-align: center;">(6)</p> $\begin{array}{r} 700 \\ .07 \\ \hline 4) 49.00 \\ \hline 12.25 \\ .408 \\ \hline \end{array}$ <p>30) 12.25</p> $\begin{array}{r} \hline .408 \end{array}$ <p>Ans. \$ 12.66</p>
<p style="text-align: center;">(7)</p> $\begin{array}{r} 2000 \\ .06 \\ \hline 12) 120.00 (10 \\ 12 \quad 1 \\ \hline 0 \quad 11 \end{array}$ <p>3 d. are $\frac{3}{10}$ of 30 d.</p> $\begin{array}{r} 10) 10 \\ \hline 1 \end{array}$ $\begin{array}{r} 2000 \\ 11 \\ \hline \end{array}$ <p>Ans. \$ 1,989</p>	<p style="text-align: center;">(8)</p> $\begin{array}{r} 100 \\ .06 \\ \hline 6) 6.00 \\ \hline 1 \\ .05 \\ \hline \end{array}$ <p>20) 1.0</p> $\begin{array}{r} \hline .05 \end{array}$ <p>Ans. \$ 1.05</p>

EQUATION OF PAYMENTS.

Lesson 136.

(1)

$\begin{array}{r} 12).060(.005 \\ 5 \\ \hline .025 \\ 1.025) 800.000 (780.487 \\ 7175 \\ \hline 8250 \\ 8200 \\ \hline 5000 \\ 4100 \\ \hline 9000 \\ 8200 \\ \hline 8000 \\ 7175 \\ \hline 825 \end{array}$	$\begin{array}{r} 4).06 \\ .015 \\ 3 \\ \hline .045 \\ 1.045) 650.000 (622.01 \\ 6270 \\ \hline 2300 \\ 2090 \\ \hline 2100 \\ 2090 \\ \hline 1000 \\ 1045 \end{array}$
--	---

(Carried over.)

EQUATION OF PAYMENTS.

(Brought over.)

780.49	800	
622.01	650	
<hr/>	<hr/>	
1402.50	1450	
.06	1402.50	
<hr/>	<hr/>	
84.1500	84.15) 47.500 (.56447	.56447 yr.
	42075	12
	<hr/>	
	54250	112894
	50490	56447
	<hr/>	<hr/>
	37600	677364 mo.
	33660	30
	<hr/>	<hr/>
	39400	2320920 d.
	33660	
	<hr/>	
	57400	Ans. 6 mo. 23 d. about.
	58905	

(3)

3).06	2).06
<hr/>	<hr/>
.02	.03
1.02) 2500.00 (2450.98	1.03) 350.00 (339.805
204	309
<hr/>	<hr/>
460	410
408	309
<hr/>	<hr/>
520	1010
510	927
<hr/>	<hr/>
1000	830
918	824
<hr/>	<hr/>
820	600
816	515
<hr/>	<hr/>
4	85

(Carried over.)

.06	(Brought over.)	
2		
3).12		
.04		
1.04)1000.00(961.538	2450.98	2500
936	339.81	350
640	961.54	1000
624	3752.33	3850
160	.06	3752.33
104	225.1398	225.1398
560		97.67000(.4338
520		9005592
400	.4338 yr.	7614080
312	12	6754194
880	8676	8598860
832	4338	6754194
48	5.2056 mo.	18446660
	30	18011184
	6.1680 d.	435476

Ans. 5 mo. 6 d. about.

(3)

4).06	2).06	3).12
.015	.03	.04
1.015)2030.00(2000	1.03)2575.00(2500	1.04)2600.00(2500
2030	206	208
000	515	520
	515	520
	00	00
	2000	
	2500	
	2500	
1.06)2862.00(2700	2700	
212	9700	10067
742	.06	9700
742	582.00	582)367.0(.63058
00		3492
		1780
		1746
		3400
		2910
		4900
		4656
		244
		.63058 yr.
		12
		126116
		63058
		7.56696 mo.
		30
		17.00880 d.
		7 mo. 17 d. about
		[Ans.

(4)

$$\begin{array}{r} 400 \\ .06 \\ \hline 2)2400 \end{array}$$

$$\begin{array}{r} 12 \\ 400 \\ \hline 412 \end{array}$$

$$\begin{array}{r} 1200 \\ 412 \\ \hline 788 \\ .06 \\ \hline 47.28 \end{array} \quad \begin{array}{r} 1200 \\ 400 \\ \hline 800 \\ 788 \\ \hline 12.000 \end{array}$$

$$\begin{array}{r} 47.28 \quad 47.28)12.000(.2538 \quad .2538 \text{ yr.} \\ \hline 9456 \quad 12 \end{array}$$

$$\begin{array}{r} 25440 \\ 23640 \\ \hline 18000 \end{array} \quad \begin{array}{r} 5076 \\ 2538 \\ \hline 30456 \text{ mo.} \end{array}$$

$$\begin{array}{r} 18000 \\ 14184 \\ \hline 38160 \end{array} \quad \begin{array}{r} 30456 \text{ mo.} \\ 30 \end{array}$$

$$\begin{array}{r} 38160 \\ 37824 \\ \hline 336 \end{array} \quad \begin{array}{r} 13680 \text{ d.} \end{array}$$

Ans. 3 mo. 1 d. about more
than 6 mo.; or 9 mo.
1 d. about.

(5)

$$\begin{array}{r} 800 \\ 5 \\ \hline 4000 \end{array} \quad \begin{array}{r} 650 \\ 9 \\ \hline 5850 \end{array}$$

$$\begin{array}{r} 800 \\ 650 \\ \hline 1450 \end{array} \quad \begin{array}{r} 4000 \\ 5850 \\ \hline 1450 \end{array} \quad \begin{array}{r} 9850 \\ 8700 \\ \hline 11500 \\ 10150 \\ \hline 13500 \\ 13050 \\ \hline 450 \end{array} \quad \begin{array}{r} 6.79 \text{ mo.} \\ 30 \\ \hline 23.70 \text{ d.} \end{array}$$

Ans. 6 mo. 24 d. nearly.

(6)

$$\begin{array}{r} 2500 \\ 4 \\ \hline 10000 \end{array} \quad \begin{array}{r} 350 \\ 6 \\ \hline 2100 \end{array} \quad \begin{array}{r} 1000 \\ 8 \\ \hline 8000 \end{array}$$

$$\begin{array}{r} 2500 \\ 350 \\ 1000 \\ \hline 3850 \end{array} \quad \begin{array}{r} 10000 \\ 2100 \\ 8000 \\ \hline 20100 \end{array} \quad \begin{array}{r} 5.22 \text{ mo.} \\ 30 \\ \hline 6.60 \text{ d.} \end{array}$$

$$\begin{array}{r} 8500 \\ 7700 \\ \hline 8000 \\ 7700 \\ \hline 300 \end{array} \quad \begin{array}{r} 5 \text{ mo. } 7 \text{ d.} \\ \text{[nearly Ans.]} \end{array}$$

	2030	2575 ⁽⁷⁾	2600	2862
	3	6	8	12
	<u>6090</u>	<u>15450</u>	<u>20800</u>	<u>5724</u>
	6090			2862
	15450			<u>34344</u>
	20800			
	34344			
10067)	76684	7.617 mo.	Ans. 7 mo. 19 d. nearly.	
	<u>70469</u>	30		
	62150	18.510 d.		
	<u>60402</u>			
	17480			
	<u>10067</u>			
	74130			
	<u>70469</u>			
	3661			

(8)

		90	19
		<u>15</u>	<u>4</u>
Jan. 4 to April 19,		105 d.	15
		90	7
		<u>3</u>	<u>4</u>
Jan. 4 to April 7,		93 d.	3
		31	28
		<u>24</u>	<u>4</u>
Jan. 4 to Feb. 28,		55 d.	24
	105	125	27
	<u>72</u>	<u>93</u>	<u>55</u>
	210	375	135
	<u>735</u>	<u>1125</u>	<u>135</u>
	7560	11625	1485
136			
27	7560	31	
1250	11625	4	41
72	<u>1485</u>	<u>27</u>	<u>27</u>
247.50	247.5)	10207.5	(41 d. or Feb. 14 Ans.
		<u>9900</u>	
		3075	
		<u>2475</u>	
		600	

EQUATION OF PAYMENTS.

(9)

Items of Cash are not on credit. Item
of Ready made Clothing is due 4 mo.
from Nov. 11, or March 11, 1841.

	61	8		
	3	5		
Sept. 5 to Nov. 8,	64 d.	3		
	61	5		181
	4	1		7
Sept. 5 to Nov. 1,	57 d.	4	Sept. 18 to March 11,	174 d.
Sept. 5 to Sept. 24,	19 d.			7
				30
				16
				2

Sept. 18 to Oct. 2, 14 d. 16

	120	68	185.5
	64	57	19
	48	476	16695
	72	340	1855
	7680	3876	3524.5
340	7680		
185.5	3876		
68	3524.5		
120			

713.5 713.5) 15080.5 (21 d. from Sept. 5, or Sept.
14270 26. Average time to pay
8105 Dr. side, is 4 mo. from
7135 Sept. 26, or Jan. 26, 1841.
970

	1948	14
	174	100
	7792	1400
	13636	
	1948	
	33895.2	
200	33895.2	
100	1400	
19480		

49480 494.8) 35295.2 (71 d. from Sept. 18, or Nov. 28;
34636 average time to pay Cr. side.
6592
4948
1644

(Carried over.)

(Brought over.)

	61	28
From Nov. 28, the average time to pay Cr. side	2	26
to Jan. 26, the average time to pay Dr. side, is	59 d.	2
	713.50	
	494.80	

Now how long may the balance, or \$218.70 remain unpaid to equal the use of \$494.80 during 59 d.?

	494.8	
	59	
	44532	
	24740	
218.7) 29193.2		(133 d. from Jan. 26, 1841, or till
2187		June 8, 1841. Ans.
7323		
6561		
7622		
6561		
10610		

PROMISCUOUS QUESTIONS

IN

PERCENTAGE, COMMISSION, STOCKS, AND SIMILAR RULES.

Lesson 138.

yr. d. (1)			
1 108			123 18
or 1 ¹⁰⁸ / ₃₆₅ yr.			15 3
			108 15
100			
.05 ¹ / ₄			
5.00			575
.25 — ¹ / ₄			108
.50 — ¹ / ₄			4600
5.75			575
1.70			
Ans \$7.45			365) 621.00 (1.70
			365
			2560
			2555
			50

$$\begin{array}{r}
 1.00 \quad (2) \\
 .05 \\
 \hline
 .95 \quad 2850 \quad \$ \quad 30 \text{ Ans.} \\
 285 \\
 \hline
 0
 \end{array}$$

$$\begin{array}{r}
 1.00 \quad (3) \\
 .08 \\
 \hline
 .92 \quad 276.00 \quad \$ \quad 300 \text{ Ans.} \\
 276 \\
 \hline
 00
 \end{array}$$

$$\begin{array}{r}
 \text{yr.} \quad \text{mo.} \quad \text{d.} \\
 1 \quad 3 \quad 5 \\
 30 \overline{) 5.0} \\
 \hline
 12 \overline{) 3.1666 \&c.} \quad (.2638 \\
 24 \\
 \hline
 76 \\
 72 \\
 \hline
 46 \\
 36 \\
 \hline
 106 \\
 96 \\
 \hline
 10
 \end{array}$$

$$\begin{array}{r}
 3900 \\
 .02 \\
 \hline
 78.00 \quad 3900 \\
 78 \\
 \hline
 3822 \\
 .15 \\
 \hline
 19110 \\
 3822 \\
 \hline
 \text{Ans. } \$573.30
 \end{array}$$

$$\begin{array}{r}
 12638 \text{ yr.} \\
 200 \\
 \hline
 2527600 \quad 126400 \quad [\text{Ans.} \\
 126380 \\
 \hline
 20
 \end{array}$$

$$\begin{array}{r}
 \text{lbs.} \quad \text{oz.} \\
 15 \quad 10 \\
 12 \overline{) 10.0} \quad (.8333 \&c. \\
 96 \\
 \hline
 40 \\
 36 \\
 \hline
 4
 \end{array}$$

$$\begin{array}{r}
 15.8333 \&c. \text{ lbs.} \\
 13 \\
 \hline
 474999 \\
 158333 \\
 \hline
 2058329 \\
 .03 \\
 \hline
 \text{Ans. } \$61749.87
 \end{array}$$

$$\begin{array}{r}
 1200 \\
 .07 \\
 \hline
 84.00
 \end{array}$$

$$\begin{array}{r}
 1216.80 \\
 1200 \\
 \hline
 84 \overline{) 16.80} \quad (.2 \text{ yr.} \\
 168 \\
 \hline
 \text{Ans. } 73.0 \text{ d.}
 \end{array}$$

(8)

$$\begin{array}{r} 100 \\ 8 \\ \hline 8 \overline{) 00} \end{array} \begin{array}{l} 26.666 \text{ \&c.} \\ .03333 \text{ \&c.} \end{array}$$

or .03 $\frac{1}{3}$ Ans.

(9)

yrs.	mo.
2	8
or 2 $\frac{2}{3}$ yrs.	
.06	.06
2	2
<hr/>	<hr/>
.12	3) .12
.04	<hr/>
<hr/>	.04
.16	\$
1.16)	81.20 (70 Ans.
	812
	<hr/>
	0

(10)

800	3 d. are $\frac{3}{90}$ or $\frac{1}{30}$ of 90 d.
.06	
<hr/>	
4) 48.00	30) 12
<hr/>	<hr/>
12.	.40
<hr/>	<hr/>
.40	
<hr/>	
12.40	
<hr/>	
800	
12.40	
<hr/>	
Ans. \$ 787.60	

Lesson 139.

(1)

.25	2000	2000
<hr/>	<hr/>	<hr/>
500.00		.10
2000		<hr/>
<hr/>		2000.00
2500 price marked.		2000
2200		<hr/>
<hr/>		2200
300 amount to deduct.		
2500) 300.0 (.12 Ans.		
<hr/>		
2500		
<hr/>		
5000		
5000		

(2)

	245	11		350	
	7	4		.06	
d.	—	—		21.00	
252	252	7		252	
or $\frac{112}{388}$ yr. time to 1st payment.				42	
	151			105	
	1			42	
	—			365)5292(	14.498
	152	13		365	or 14.50
	2	11		1642	
d.	—	—		1460	
154	154	2		1820	
or $\frac{112}{388}$ yr. time from 1st to 2nd				1460	
[payment.				3600	
	153	13		3285	
	1	12		3150	
d.	—	—		2920	
152	152	1		230	
or $\frac{112}{388}$ yr. time from 2nd payment					
[to Nov. 12th.					
	350				
	35.50				
	314.50	1st rem.			
	.06				
	18870				
	154				
	7548				
	9435				
	1887				
365)2905.98(7.96		25			
2555		7.96		314.50	
		17.04 excess.		17.04	
	3509			29746 2d rem.	
	3285			.06	
	2248			178476	
	2190			152	
	58			356952	
				892380	
				178476	
				365)27128352(7.43	7.43
				2555	29746
				1578	Ans. \$304.89
				1460	
				1183	
				1095	
				88	

(3)

$\begin{array}{r} 150 \\ .06 \\ \hline 9.00 \\ 3 \\ \hline 4) 27 \\ \hline 6.75 \\ 150 \\ \hline 156.75 \end{array}$	$\begin{array}{r} 400 \\ 156.75 \\ \hline 243.25 \\ .06 \\ \hline 14.5950 \end{array}$	$\begin{array}{r} 6.7500 \text{ (.46248 yr.)} \\ 58380 \\ \hline 91200 \\ 87570 \\ \hline 36300 \\ 29190 \\ \hline 71100 \\ 58380 \\ \hline 127200 \\ 116760 \\ \hline 10440 \end{array}$	$\begin{array}{r} .46248 \\ 12 \\ \hline 92496 \\ 46248 \\ \hline 554976 \text{ mo.} \\ 30 \\ \hline 1649280 \text{ d.} \end{array}$
--	--	---	--

(4)

$$\begin{array}{r} 4000 \\ .20 \\ \hline \text{Ans. } \$800.00 \end{array}$$

(5)

$$\begin{array}{r} 10.676581 \\ 700 \\ \hline 7473.606700 \end{array}$$

Ans. \$7,473.61

(6)

$$\begin{array}{r} 2).06 \\ .03 \\ 1. \\ \hline 1.03) 250.25 \text{ (242.96)} \\ 206 \\ \hline 442 \\ 412 \\ \hline 305 \\ 206 \\ \hline 990 \\ 927 \\ \hline 630 \\ 618 \end{array}$$

$$\begin{array}{r} .06 \\ 3 \\ 4).18 \\ .045 \\ 1. \\ \hline 1.045) 11300 \text{ (10.81)} \\ 1045 \\ \hline 8500 \\ 8360 \\ \hline 1400 \\ 1045 \\ \hline 355 \end{array}$$

(Carried over.)

(Brought over.)

$$\begin{array}{r}
 15 \\
 12 \\
 \hline
 3 \text{ mo.} \\
 .06 \quad 4) .06 \\
 .015 \quad .015 \\
 \hline
 1. \\
 1.075 \overline{) 65.000} (60.465 \\
 \underline{6450}
 \end{array}$$

$$\begin{array}{r}
 5000 \\
 4300 \\
 \hline
 7000 \\
 6450 \\
 \hline
 5500 \\
 5375 \\
 \hline
 125
 \end{array}$$

$$\begin{array}{r}
 24296 \\
 1081 \\
 60465 \\
 100917 \\
 \hline
 415.15 \\
 .06 \\
 \hline
 249090
 \end{array}$$

249090

$$\begin{array}{r}
 250.25 \\
 1130 \\
 65. \\
 110. \\
 \hline
 436.55 \\
 415.15 \\
 \hline
 214000
 \end{array}$$

24909) 214000 (.859 yr.

190272

.859
12

$$\begin{array}{r}
 (7) \\
 580 \text{ yr. mo.} \\
 .06 \quad 1 \quad 3 \\
 \hline
 34.80 \text{ or } 1\frac{1}{4} \text{ yr.} \\
 8.70 \quad 4) 34.80 \\
 \hline
 43.50 \quad 8.70
 \end{array}$$

$$\begin{array}{r}
 147280 \\
 124545 \\
 \hline
 227350 \\
 224181 \\
 \hline
 3169
 \end{array}$$

$$\begin{array}{r}
 1718 \\
 859 \\
 \hline
 10308 \text{ mo.} \\
 30 \\
 \hline
 9240 \text{ d.}
 \end{array}$$

Ans. 10 mo. 9 d. about.

$$\begin{array}{r}
 580 \\
 43.50 \\
 \hline
 623.50
 \end{array}$$

\$ 536.50 Ans.

(8)

	245	15	231	1000
	14	1	400	60
d.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
231	231	14	92400	60000
or $\frac{231}{365}$ yr. time 1st Dr. item runs.			92400	
	61	2	60000	
	1	1	<u> </u>	<u> </u>
d.	<u> </u>	<u> </u>	152400	
60	60	1	.06	
or $\frac{60}{365}$ yr. time 2d Dr. item runs.			<u> </u>	<u> </u>
	275	3	365) 9144.00	(25.05
	2	1	730	400
d.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
273	273	2	1844	1000
or $\frac{273}{365}$ yr. time 1st Cr. item runs.			1825	1425.05
	153	31	<u> </u>	<u> </u>
	30	1	1900	
d.	<u> </u>	<u> </u>	1825	
123	123	30	<u> </u>	<u> </u>
or $\frac{123}{365}$ yr. time 2d Cr. item runs.			75	
	273	123		
	800	900		
	<u> </u>	<u> </u>		
	218400	110700		
	218400			
	110700			
	<u> </u>			
	329100			
	.06			
	<u> </u>			
365) 19746.00	(54.098		54.10	
1825			800	
<u> </u>			900	
1496			<u> </u>	
1460			1754.10	
<u> </u>			1425.05	
3600			<u> </u>	
3285				
<u> </u>				
3150				
2920				
<u> </u>				
230				

Ans. \$329.05 due George
[Draper.]

RULE OF THREE.

Lesson 143.

(1)	(2)	(3)
18)324(18	18	4) 2.0
18	23	<u> </u>
<u> </u>	<u> </u>	2) 5
144	54	<u> </u>
144	36	Ans. \$ 2.5 0
<u> </u>	<u> </u>	
Ans. \$ 414	Ans. 6	

(4)	(5)	(6)
4) 26	19) 123.5 (6.5	5) 125
<u> </u>	114	<u> </u>
65	<u> </u>	25) 275 (11 Ans.
19	95 Ans. \$26.0	25
<u> </u>	95	<u> </u>
585		25
65		25
<u> </u>		
Ans. \$ 12350		

(7)	(8)	
12	$\frac{3}{4}$ of $\frac{1}{2}$	7500
6	3 2	15
<u> </u>	5 4	<u> </u>
8)72	<u> </u>	375
<u> </u>	15 8	75
Ans. 9 days.	$\frac{8}{15}$	8) 112500
		<u> </u>
		Ans. \$ 14,062.50

(9)	(10)
15	bu. pks.
7	18 3
<u> </u>	4) 3.0
22) 35.20 (1.60	18.75) 28.125 (1.5
22	15
<u> </u>	<u> </u>
132	80
132	16
<u> </u>	<u> </u>
0 A. \$24.0, B. \$11.20 Ans.	1.60
	7
	<u> </u>
	9375 Ans \$15.0
	9375

Lesson 144.

$$\begin{array}{r}
 \text{(2)} \\
 18232 \\
 \underline{3} \\
 53 \overline{) 54696} (1,032 \text{ Ans.} \\
 \underline{53} \\
 169 \\
 \underline{159} \\
 106 \\
 \underline{106}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 6 \frac{1}{2} \\
 8 \overline{) 3.0} \\
 \underline{5} 6.375 \\
 \underline{1.275} \\
 12 \frac{1}{2} \\
 \underline{2550} \\
 1275 \\
 \underline{425} - \frac{1}{2} \\
 \underline{425} - \frac{1}{2}
 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \\
 20 \overline{) 16} \\
 \underline{20} \\
 3 \\
 \underline{70} \\
 \text{Ans. } 21.0
 \end{array}$$

Ans. \$16.150

$$\begin{array}{r}
 \text{(5)} \\
 16 \\
 \underline{9} \\
 6 \overline{) 144} \\
 \text{Ans. } 24 \text{ days.}
 \end{array}$$

$$\begin{array}{r}
 \text{(6)} \\
 \frac{1}{12} \text{ for 1 soldier a day.} \\
 2300 \\
 \underline{17} \\
 161 \\
 \underline{23} \\
 12 \overline{) 39100} (3,258 \frac{1}{2} \text{ lbs. Ans.} \\
 \underline{36} \\
 31 \\
 \underline{24} \\
 70 \\
 \underline{60} \\
 100 \\
 \underline{96} \\
 4 \overline{) 12} (\frac{1}{3}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \text{cwt. qrs. lbs.} \\
 15 \quad 2 \quad 8 \frac{1}{2} \\
 28 \overline{) 8.25} (.2946 \quad 4) 2.2946 \\
 \underline{56} \\
 \text{cwt. } 15.57369 \\
 \underline{265} \\
 252 \\
 \underline{130} \\
 112 \\
 \underline{180} \\
 168 \text{ Ans. } \$87.21 \\
 \underline{12}
 \end{array}$$

A. qrs. sq. rods.
83 3 17

$$\begin{array}{r}
 40 \overline{) 17} \\
 4 \overline{) 3.425} \\
 8385625 \text{ A.}
 \end{array}$$

A. qrs. sq. rods.
5 2 38

$$\begin{array}{r}
 40 \overline{) 38} \\
 4 \overline{) 2.95} \\
 57375 \text{ A.}
 \end{array}$$

$$\begin{array}{r}
 8385625 \overline{) 83856250} (10 \text{ an acre.} \\
 \underline{8385625} \\
 0
 \end{array}$$

$$\begin{array}{r}
 57375 \\
 \underline{10} \\
 57375 \\
 \text{Ans. } \$57.37 \frac{1}{2}
 \end{array}$$

RULE OF THREE.

(9)

	hhds.	tier.	gals.
80) 18	2	1	23
<u>\$.225 a gal.</u>	63		
	126		
	42		
	23		
	191		
	225		
	955		
	382		
	382		
Ans. \$	42.975		

(10)

h.	min.	sec.	
1	23	10	24
60			3 d.
60			72
23			60
83			4320
60			60
4980			259200 sec.
10			16000
4990			15552
			2592

$\frac{16000}{4990}$ cubic ft. 4990) 41472000.00 (831,102 $\frac{102}{199}$ cubic ft.
 [a sec. 39920 [Ans.

$$\begin{array}{r} 15520 \\ 14970 \\ \hline \end{array}$$

$$\begin{array}{r} 5500 \\ 4990 \\ \hline \end{array}$$

$$\begin{array}{r} 5100 \\ 4990 \\ \hline \end{array}$$

$$\begin{array}{r} 11000 \\ 9980 \\ \hline \end{array}$$

$$\frac{1020}{1990} \text{ or } \frac{102}{199}$$

Lesson 145.

<p>(1)</p> $\begin{array}{r} 5 \\ 3 \\ \hline 110 \overline{) 115} \\ 1.5 \text{ or } 1\frac{1}{2} \text{ d.} \\ \text{[Ans.]} \end{array}$	<p>(2)</p> $\begin{array}{r} \frac{2}{3} \text{ of } \frac{2}{3} \\ 9 \quad 2 \\ 4 \quad 3 \\ \hline 36 \quad 6 \\ \frac{2}{3} \text{ or } \frac{1}{3} \quad 6 \\ \hline 12000 \\ \text{Ans. } \$72,000 \end{array}$	<p>(3)</p> $\begin{array}{r} 13\frac{1}{4} \\ 8 \overline{) 7.0} \\ \hline 13875 \\ 4.25 \overline{) 17.00} (4 \\ 1700 \\ \hline \text{Ans. } \$55.500 \end{array}$
---	--	---

<p>(4)</p> $\begin{array}{r} \text{cwt. qrs. lbs.} \\ 6 \quad 3 \quad 27 \\ 4 \\ \hline 24 \\ 3 \\ \hline 27 \\ 28 \\ \hline 216 \\ 54 \\ 27 \\ \hline 783 \\ 3 \\ \hline 2349 \\ \$ \frac{181}{2845} \text{ a lb. } 2349 \\ \hline 16443 \\ 18792 \\ 783 - \frac{1}{3} \\ \hline 135 \overline{) 205146} (1,519.6 \text{ lbs. Ans.} \\ 135 \\ \hline 701 \\ 675 \\ \hline 264 \\ 135 \\ \hline 1296 \\ 1215 \\ \hline 810 \\ 810 \end{array}$	<p>(5)</p> $\begin{array}{r} 120 \\ 80 \\ \hline 150 \overline{) 9600} (64 \text{ days Ans.} \\ 900 \\ \hline 600 \\ 600 \end{array}$	<p>(6)</p> $\begin{array}{r} 112 \\ 20 \\ \hline 2240 \\ 6\frac{1}{2} \\ \hline 13440 \\ 560 - \frac{1}{4} \\ \hline 2000 \overline{) 14000} \\ 7 \\ 28 \\ \hline 56 \\ 14 \\ \hline 16 \overline{) 196} (12\frac{1}{4} \text{ modern} \\ 16 \quad \text{[tons Ans.]} \\ \hline 36 \\ 32 \\ \hline 4 \overline{) 16} (\frac{1}{4} \\ \hline \end{array}$
		<p>(7)</p> $\begin{array}{r} 575 \\ 100 \overline{) 20.0} (.2 \\ 200 \\ \hline \text{Ans. } 115.0 \text{ bushels.} \end{array}$

RULE OF THREE.

(8)	(9)	(10)
400	169	\$.33 $\frac{1}{2}$
9	25	or \$ $\frac{1}{3}$
<u>600</u> 3600	97) 194 (2 2	1.25) $\frac{1}{3}$ 1.25) 11.00 (3
	194	1000
Ans. 6 mo.	Ans. \$ 10	2.9333 &c.
		1000 or \$ 2.93 $\frac{1}{3}$
		1000 [Ans.]

Lesson 146.

(1)	(2)
6.25) 5.300 (.848 .848	$\frac{3}{4}$ of $\frac{7}{8}$
5000	3 2
	8 7
3000 \$ 16.960	24 14
2500 [Ans.]	$\frac{11}{12}$ or $\frac{7}{12}$ 112
5000	
5000	784 19.375
(3)	$\frac{11}{12}$ lb. 12
.33 $\frac{1}{2}$ or $\frac{1}{3}$	38750
3	19375
.75) 13.50 (18	784) 232.500 (296.556
75	1568 \$.9966
600 \$ 6 Ans.	7570 [nearly
600	7056 [Ans.]
(4)	
112.5	5140
1.5	4704
5625	4360
1125	3920
$\frac{3}{4}$ of .75) 168.75 (225 Ans.	4400
150	3920
187	4800
150	4704
375	96
375	

(5)		(6)	
	$\frac{7}{8}$	13° 10' 35"	
	8) 7.0	60	
9 1.5		780	
.875	.875	10	
<u>4575</u>			
6405		790	360°
7320		60	60
<u>1006</u>			
875			
<u>1812</u>			
1225			
<u>875</u>			
875			15255 rem. or
			24 $\frac{14211}{1111}$ d.
(7)		61020	
	37	30510	
.1875) 7500 (4	4		
7500		) 366120 (7 h.	
Ans. 148 lbs.		332045	
(8)		34075	
63	42	60	
2	3		
<u>126</u> gals. in 1 pipe.		) 2044500 (43 min.	
		189740	
$\frac{3}{4}$ or .75) 100.00 (133.333 &c.		147100	
75 or $\$133.33\frac{1}{3}$ Ans.		142305	
<u>250</u>		4795	
225		60	
<u>250</u>			
225		) 287700 (6 sec.	
<u>25</u>		284610	
		3090	

(9)		(10)	
C. ft.	T. cwt. qrs.	ft.	ft. in.
3 5	1 5 3	7	3 2
8	20	12 4	12
<u>24</u>	<u>20</u>	<u>14</u> <u>1½</u>	<u>36</u>
5	5	7 4	2 2
<u>29</u>	<u>25</u>	<u>84</u> <u>2 — ½</u>	<u>38</u> <u>2</u>
	4	6 6	4 4
	<u>100</u>	<u>504</u> cubic in.	<u>142</u> cubic in.
	3	<u>140</u> lbs.	<u>140</u>
	<u>103</u>		<u>568</u>
	28		142
	<u>824</u>		504)19880(39 lbs.
	206		<u>1512</u>
	<u>2884</u>		<u>4760</u>
1 lb. of	2884 ft. of wood.		<u>4536</u>
hay buys	29		224 rem. or
	2000 8		16 [<u>224</u> lbs.
	2884)58000 (20 — 4 ft.		<u>1344</u>
	5768 2 C.		<u>224</u>
	320)320 (½ nearly.		)3584(7½ oz.
	Ans. 2 C. 4½ ft. nearly.		<u>3528</u>
			56)352(½

Lesson 147.

(1)		(2)	
A.	qrs. sq. rods.	A.	qrs. sq. rods.
75	9 7	4	2 4
4	3.5	4	
<u>300</u>	<u>485</u>	<u>16</u>	
10	291	<u>2</u>	
<u>8)3000</u>	<u>339.5</u>	<u>18</u>	
	9	<u>40</u>	
		<u>720</u>	
375	375)3055.5 (8.148 d.	<u>4</u>	
	3000 [Ans.	<u>724</u>	
		<u>3620</u>	
	555	4344 40	4 A.
	375	125)470600(3764.8(94(23	
		<u>375</u>	<u>360</u>
	1800	<u>956</u>	<u>164</u>
	1500	<u>875</u>	<u>160</u>
		<u>810</u>	<u>4.8</u> 2 qrs.
	3000	<u>750</u> [sq. rods.	
	3000	<u>600</u>	
		<u>500</u>	
		<u>1000</u>	
		<u>1000</u>	

(3)

	gals.	qts.	pt.		gals.	qts.
	10	3	1 or .5 qt.		27	2
	4				4	
	<u>40</u>				<u>108</u>	
	3				2	
	<u>43.5</u> qts.				<u>110</u>	
\$ 16.16 $\frac{2}{3}$					16 $\frac{1}{2}$	
or \$ 16 $\frac{1}{2}$					<u>110</u>	
\$ 16 $\frac{1}{2}$					16	
\$ 43.5 cost of 1 qt.					<u>16</u>	
					16	
					<u>1760</u>	
					183333 &c. $\frac{1}{3}$ of 110	
					<u>\$</u>	
					435) 17783333 (40.88 Ans.	
					<u>1740</u>	
					3833	
					<u>3480</u>	
					3533	
					<u>3480</u>	
					53	

(4)

cwt.	qrs.	lbs.		cwt.	qrs.	lbs.
5	3	7 $\frac{1}{2}$		6	0	18
4				4	3	
<u>20</u>				<u>10</u>	<u>3</u>	<u>18</u>
3				4		
<u>23</u>				40		
28				3		
<u>184</u>				43		
46				<u>28</u>		
7.25				344		
<u>651.25</u> lbs.				86		
				18		
				<u>1222</u> lbs.		
				50		
\$ 50				651.25) 61100.00 (93.819		
\$ 651.25 a lb.				586125		\$ 93.82 Ans.
				<u>248750</u>		
				195375		
				<u>533750</u>		
				521000		
				<u>127500</u>		
				65125		
				<u>623750</u>		
				586125		
				<u>37625</u>		

RULE OF THREE.

		(7)			
	(5)	chal.	bu.	pk.	bu.
	960	257	15	3	or .75
	11	36			
	<hr/>	<hr/>			
	96	1542			
	96	500.00	771		
	<hr/>	2000	15.75		
14)	10560(754 $\frac{1}{2}$ times	2500	9267.75		
	98 [Ans.				
	<hr/>				
	76				
	70				
	<hr/>				
	60				
	56				
	<hr/>				
	2) $\frac{1}{11}$ ($\frac{1}{11}$)				
	<hr/>				
	(6)				
	4000				
	58				
	29				
	20				
	35				
	500				
64)	4642(72.53125	9267.75	1215000.00	131.099	
	448	13	926775	\$131.10	
	<hr/>				
	162	21759375	2882250	[Ans.	
	128	7253125	2780325		
	<hr/>				
	340	94290625	1019250		
	320	\$942.91 Ans.	926775		
	<hr/>				
	200		9247500		
	192		8340975		
	<hr/>				
	80		9065250		
	64		8340975		
	<hr/>				
	160		724275		
	128				
	<hr/>				
	320				
	320				

(8)

$ \begin{array}{r} 28) \frac{3}{4} (\frac{1}{2} \\ \hline 56 \\ 4 \\ \hline 60 \\ 24 \\ \hline 24 \\ 12 \\ \hline 96) 1440 (15 - 1 \text{ d.} \\ 96 \quad \quad \\ \hline 480 \\ 480 \\ \hline \end{array} $	$ \begin{array}{r} 10 \\ 2\frac{1}{2} \\ \hline 7\frac{3}{4} \text{ pun.} \\ \quad \text{[left.} \\ 7 \\ 3 \\ \hline 21 \\ 2 \\ \hline 23 \\ \hline 2\frac{3}{4} \text{ pun. left.} \\ \hline \end{array} $	$ \begin{array}{r} 800 \\ .09 \\ \hline 72.00 \\ 72 \\ \hline 728 \\ 3 \\ \hline 23) 2184 (94.9565 \quad 94.9565 \\ 207 \quad \quad \quad 3 \\ \hline 114 \quad \quad \quad 2848695 \\ 92 \quad \quad \quad \text{Ans. } \$284.87 \\ \hline 220 \\ 207 \\ \hline 130 \\ 115 \\ \hline 150 \\ 138 \\ \hline 120 \\ 115 \\ \hline 5 \end{array} $
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(10)

$ \begin{array}{r} .975) 3250 (3.333 \text{ \&c., or } 3\frac{1}{3} \\ 2925 \\ \hline 3250 \\ 2925 \\ \hline 325 \end{array} $	$ \begin{array}{r} 5.46 \\ 3\frac{1}{3} \\ \hline 16.38 \\ 182 - \frac{1}{3} \\ \hline \text{Ans. } 18.20 \text{ lbs.} \end{array} $
--	--

Lesson 148.

(1)

A can reap $\frac{1}{8}$ in 1 d. B can reap $\frac{1}{10}$ in 1 d.

$\frac{1}{8}$ and $\frac{1}{10}$

6
10
60

A and B can reap $\frac{19}{80}$ and $\frac{9}{80}$ or $\frac{18}{80}$ in 1 d. 16) 60 (3 $\frac{3}{4}$ d. Ans.

48
4) $\frac{18}{80}$ ($\frac{9}{40}$

RULE OF THREE.

(2)

 $\frac{1}{12}, \frac{1}{15}, \frac{1}{30}, \text{ and } \frac{1}{45}$
 or $\frac{15}{180}, \frac{12}{180}, \frac{6}{180}, \text{ and } \frac{4}{180}, \text{ or } \frac{37}{180}$
37)180(4 min.
148

32

60

)1920(51 $\frac{2}{3}$ sec.

185

70

37

 $\frac{2}{3}$

(3)

10 8

8 5

2 2)40

Ans. 20 h.

(4)

4.50

1.45

3.05

365

1525

1830

915

1113.25

180

933.25

3000

.06

180.00

3000 to pay.

1000

3733.00
3733.00267.00 rem. or $\frac{267}{365}$ yr.

365

1335

1602

801

)97455.00(104 d. about.
93325

413000

373300

39700

(5)

The hour hand
is 60 minutes
ahead; the min.
hand gains - - 55 min. or $\frac{11}{12}$ h.
[in 1 h.]

(6)
A can mow $\frac{1}{11}$ in 1 d. and A and B $\frac{1}{7}$ in 1 d.

$\frac{1}{11}$ from $\frac{1}{7}$
11
7

77

or $\frac{7}{77}$ from $\frac{1}{11}$, or $\frac{1}{11}$ 4)77(19 $\frac{1}{11}$ d.
[Ans.]

55)60(1 h.

55

5
60

)300(5 min.

275

25
60

)1500(27 $\frac{3}{11}$ sec.

110

400
385

5)11 $\frac{1}{11}$

(7)
3.5
2.7 5

6.2 5

1 1 0
5 0

6 0 0 0 (9 h.
5 6 2 5

3 7 5 rem. or $\frac{375}{1000}$ h.
6 0

)22500(36 min.
1875

3750
3750

(8)

In 1 h. A travels $\frac{1}{20}$ of the distance and B $\frac{1}{30}$

$\frac{1}{20}$ and $\frac{1}{30}$
or $\frac{3}{60}$ and $\frac{2}{60}$, or $\frac{5}{60}$ 5)60
Ans. 12 h.

(9)

T. cwt. qr.
1 2 1

20
20

2
22
4

88
1

3)89

29.66666 &c. will last 1 horse.

7 20

4)207.66662(51(2 T.

20 40

7 11 cwt.
4

3.666 &c.
or 3 $\frac{2}{3}$ qrs.

(10)

31
200

250)6200(24 A.

500

1200
1000

200
4

)800(3 qrs.
750

50
40

)2000(8 sq. rods.
2000

RULE OF THREE COMPOUND.

Lesson 149.

(1)

$$\begin{array}{r}
 150 \\
 2 \\
 \hline
 18 \overline{) 300} (16\frac{2}{3} \text{ yrs. for the in. of} \\
 18 \quad [\$ 1 \text{ to amount to } \$ 1. \\
 \hline
 120 \\
 108 \\
 \hline
 6 \overline{) 12} (2
 \end{array}$$

$$\begin{array}{r}
 162 \\
 162 \\
 \hline
 972 \\
 162 \\
 \hline
 54 - \frac{1}{3} \\
 54 - \frac{1}{3} \\
 \hline
 675 \overline{) 2700} (4 \text{ yrs.} \\
 2700 \quad [\text{Ans.}
 \end{array}$$

(2)

$$\begin{array}{r}
 4 \overline{) 4} \\
 \hline
 \$ 1, \text{ in. of } \$ 200 \text{ for 1 mo.} \\
 \$ 15, \text{ in. of } \$ 200 \text{ for 15 mo.} \\
 \frac{5}{100} \text{ of } \$ 15, \text{ in. of } \$ 590 \text{ for 15 mo.} \\
 590 \\
 15 \\
 \hline
 295 \\
 59 \\
 \hline
 2 \overline{) 00} 88 \overline{) 50} \\
 \hline
 \text{Ans. } \$ 44.25
 \end{array}$$

(3)

$$\begin{array}{r}
 19 \\
 16 \\
 \hline
 114 \\
 19 \\
 \hline
 76 \text{ bu. will last 1 horse } 304 \text{ d.} \\
 3 \overline{) 304} \\
 \hline
 76 \text{ bu. will last 3 horses } 101\frac{1}{3} \text{ d.} \\
 12 \text{ bu. will last 3 horses } 1\frac{2}{3} \\
 \text{of } 101\frac{1}{3} \text{ d.} \\
 101\frac{1}{3} \\
 12 \\
 \hline
 202 \\
 101 \\
 \hline
 4 - \frac{1}{3} \\
 \hline
 76 \overline{) 1216} (16 \text{ days Ans.} \\
 76 \\
 \hline
 456 \\
 456
 \end{array}$$

(4)

cwt. qrs. lbs.
14 2 17

4

56

2

58

28

464

116

17

1641 lbs.

\$ $\frac{3}{1641}$ for 1 lb. 42 m.

1641

42

3282

26

6564

3

68922

78

\$ $\frac{3}{68922}$ for 1 lb. 1 m. \$ $\frac{78}{68922}$ for 1 lb. 26 m. 68922)1048320 (15.21

112

20

2240

6 T.

13440 lbs.

78

10752

9408

\$

68922)1048320 (15.21

68922 [Ans.

359100

344610

144900

137844

70560

68922

1638

(5)

33

14

132

33

462

5

2310

1 man can build $\frac{2310}{4}$ cubic ft. in 13 d.

13

4

52

1 man can build $\frac{2310}{52}$ cubic ft. in 1 d.

2310

7

16170

7 men can build $\frac{16170}{52}$ cubic ft. in 1 d.

40

24

80

20

100

7

700

52

14

35

16170)36400(24 d. about

3234 [Ans.

7)406(58

$$\begin{array}{r} (6) \\ 3 \overline{) 24} \end{array}$$

The rice is $\overline{8}$ cts. a lb.

$$\begin{array}{r} 12 \\ 8 \\ 5 \overline{) 96} \end{array}$$

The coffee is $\overline{19.2}$ cts. a lb.

$$\begin{array}{r} 1536 \\ 1344 \\ 14976 \\ \text{Ans. } \$14.98 \end{array}$$

Lesson 150.

(1)

$$\begin{array}{r} 8 \\ 6 \\ \hline \end{array}$$

48 h.
7 men.

1 man in 336 h. could hoe 21 A.

21) 336 (16 h. for 1 man to hoe 1 A.

$$\begin{array}{r} 21 \\ \hline \end{array}$$

— 4 h. for 4 men to hoe 1 A.

$$\begin{array}{r} 126 \\ 126 \\ \hline \end{array}$$

$$\begin{array}{r} 16.5 \\ 4 \\ \hline \end{array}$$

11) 66.0 h. for 4 men to hoe
[16½ A.

Ans. 6 days.

(2)

15) 75 (5 d. 1 bu. lasts 12 men.

$$\begin{array}{r} 12 \\ 5 \\ \hline \end{array}$$

3) 6 (0 d. 1 bu. lasts 1 man.

2 d. 1 bu. lasts 30 men.

$$\begin{array}{r} 45 \\ 10 \\ 8 \\ \hline \end{array}$$

Ans. 90 d. 45 bu. last 30 men.

(2)

$$\begin{array}{r} \frac{1}{2} \\ \frac{1}{2} \\ \hline \end{array}$$

$$\begin{array}{r} 3 \quad 4 \\ 5 \quad 2 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \quad 8 \\ \hline \end{array}$$

1½ d. for 12 men to load
[1 vessel.

$$\begin{array}{r} 15 \\ 12 \\ \hline \end{array}$$

$$\begin{array}{r} 30 \\ 15 \\ \hline \end{array}$$

$$\begin{array}{r} 180 \\ \hline \end{array}$$

1½ d. for 1 man.

$$5) 180$$

$$\begin{array}{r} 36 \\ \hline \end{array}$$

2½ d. for 5 men.

$$\begin{array}{r} 36 \\ 3 \\ \hline \end{array}$$

$$8) 108$$

Ans. 13½ d. for 5 men to load
[3 vessels.

(4)

32 w.	20 w.		
7	7		
<hr/>	<hr/>		
224 d.	140		
32 oz.	32		
<hr/>	<hr/>		
448	28		
672	42		
<hr/>	<hr/>		
7168	4480		
400	400		
<hr/>	<hr/>		
2867200 oz.	1792000 oz. used in 20 w.	400	30 w.
1792000	The remaining provisions are to last	50	7
		<hr/>	<hr/>
		350	210 d.
1075200 oz. remaining.			

210)1075200(5120 oz. for 350 men in a day.	350)5120(1442 oz.
105	350 [Ans.
<hr/>	<hr/>
252	1620
210	1400
<hr/>	<hr/>
420	220
420	
<hr/>	
0	

(5)

$\frac{1}{2}$ of $\frac{3}{4}$		
8	3	
4	5	
<hr/>	<hr/>	
32	15	
$\frac{1}{2}$ sq. yds. cost \$ 24 or \$ $\frac{3}{4}$		
15	32	
4	9	
<hr/>	<hr/>	
60	288	
1 sq. yd. cost \$ $\frac{288}{9}$		
$3\frac{1}{2}$ or $\frac{1}{2}$ of $1\frac{1}{2}$ or $\frac{7}{7}$		
2	7	
4	7	
<hr/>	<hr/>	
8	49	
$\frac{4}{9}$ sq. yd. in 2d piece.		

$\frac{4}{9}$ times \$ $\frac{288}{9}$	
8	288
60	49
<hr/>	<hr/>
480	2592
	1152
<hr/>	<hr/>
	\$
480)14112(29.40 Ans.	
	960
<hr/>	<hr/>
	4512
	4320
<hr/>	<hr/>
	1920
	1920

$$\begin{array}{r} (6) \quad .75 \\ \underline{.8} \end{array}$$

\$~~15.50~~_{8.75} cost of 1 load. .600 as much in the 2d quantity as
[in the 1st load.]

$$\begin{array}{r} 15.50 \\ \underline{.6} \\ .875) 9.300 (10.628 \\ \underline{875} \quad \$10.63 \\ \text{[Ans.]} \\ 5500 \\ \underline{5250} \\ 2500 \\ \underline{1750} \\ 7500 \\ \underline{7000} \\ 500 \end{array}$$

$$\begin{array}{r} (7) \\ 3) 21 \\ \underline{21} \\ \$7 \text{ price of 1 man 6 d.} \end{array}$$

$$\begin{array}{r} 6) 7 \\ \underline{1.1666} \text{ \&c.} \end{array}$$

or \$1.16 $\frac{2}{3}$ price of 1 man 1 d.
15

$$\begin{array}{r} 580 \\ 116 \\ 5 - \frac{1}{3} \\ 5 - \frac{1}{3} \end{array}$$

\$1750 price of 1 man 15 d.
1750) 15750 (9 Ans.
15750

CHAIN RULE.

Lesson 151.

$\begin{array}{r} (3) \\ 8 \quad 6 \\ 15 \quad 16 \\ \underline{40} \quad \underline{36} \\ 8 \quad 6 \\ \underline{96} \quad \underline{30} \\ 120 \quad 30 \\ \underline{20} \quad \underline{2880} \\ 2400 \quad 40 \\ \underline{2400} \quad 115200 (48 \\ 96 \quad \text{[Ans.]} \\ 192 \\ \underline{192} \end{array}$	$\begin{array}{r} (4) \\ 25 \\ 31 \\ \underline{25} \\ 75 \\ \underline{775} \\ 31 \quad 16 \\ 10 \quad \underline{4650} \\ 310 \quad 775 \\ \underline{310} \quad 12400 (40 \\ 134 \quad \text{[Ans.]} \\ 0 \end{array}$	$\begin{array}{r} (5) \\ 12 \\ 15 \\ \underline{60} \\ 25 \quad 12 \\ 10 \quad \underline{180} \\ 250 \quad 50 \\ \underline{250} \quad 9000 (36 \\ 75 \quad \text{[Ans.]} \\ 150 \\ \underline{150} \end{array}$
--	---	---

BARTER.

Lesson 152.

(6)

$$\begin{array}{r}
 \text{C.} \quad \text{ft.} \\
 19 \quad 7 \\
 8) 7.0 \\
 \hline
 19.875 \text{ C.} \\
 6 \\
 3) 119.250 \\
 \hline
 \text{quintals } 39.75 \\
 112 \\
 150 \\
 75 \\
 75 \\
 \hline
 \text{lbs. } 84.00
 \end{array}$$

(7)

$$\begin{array}{r}
 43125 \\
 12 \\
 \hline
 86250 \\
 43125 \\
 \hline
 51.75000 \text{ (124.2 bu. Ans.} \\
 4166 \\
 10083 \\
 8333 \\
 \hline
 17500 \\
 16666 \\
 \hline
 8333 \\
 8333
 \end{array}$$

In this sum we proceed as if the decimals 66 &c. were carried out to a great extent, thus; .41666666. Take a similar course in like cases.

(8)

$$\begin{array}{r}
 .125 \text{ or } \frac{1}{8} \\
 4.75 \\
 8 \\
 \hline
 \text{Ans. } 38.00 \text{ lbs.}
 \end{array}$$

(9)

$$\begin{array}{r}
 15 \\
 38 \frac{3}{8} \quad 36 \\
 90 \\
 45 \\
 310) 5410 \\
 \hline
 \text{Ans. } 18 \text{ cents a doz.}
 \end{array}$$

(10)

$$\begin{array}{r}
 .42 \\
 80 \\
 \hline
 33.60 \\
 15 \\
 .08) 18.60 \\
 \hline
 232.5 \\
 \text{or } 232\frac{1}{2} \text{ lbs.} \\
 \text{[Ans.}
 \end{array}$$

(11)

$$\begin{array}{r}
 5 \\
 \frac{7}{8} \quad 7 \\
 \hline
 6) 35 \\
 \hline
 \$ 5.83\frac{1}{3} \text{ a C.} \\
 12 \\
 6 \\
 \hline
 5) 72(14 \text{ C.} \\
 5 \\
 \hline
 22 \\
 20 \\
 \hline
 2 \text{ or } \frac{2}{3} \text{ of a C.} \\
 8 \\
 \hline
 16(3.2 \text{ ft.} \\
 15 \\
 \hline
 10
 \end{array}$$

(12)

cwt.	qrs.	lbs.
7	3	16.8
4		
28		
3		
31		
28		
248		
62		
16.8		
884.8 lbs.		
	553	
	20	
	11060	(12.5
	8848	
	22120	12\frac{1}{2} \text{ cts.}
	17696	Ans.
	44240	
	44240	

ASSESSMENT OF TAXES.

Lesson 153.

(1)

2368.07
 939.81
 2500.

6)5307.88

\$967.98 whole poll tax.

663)967.98 (1.46
 663 2 polls.

3049 \$2.92 tax on 2 polls.
 2652

3978
 3978

5807.88
 967.98

4373
 813

~~4839.80~~ tax on \$1
~~3540.00~~

4839.90 tax on estates.
 5186

5186 whole estate.

290394
 387192
 48399
 241995

354000)250997214 (70.90 tax on estate.
 2478000 2.92 tax on 2 polls.

3197214 \$73.82 Ans.
 3186000

112140

(2)

1.46 tax on 1 poll. ~~4839.80~~ tax on \$1. 4839.9
 3 ~~3540.00~~ 2175

1000
 1175
 2175 whole
 [estate.]

4.38 tax on 3 polls.

241995
 338793
 48399
 96798

10526782.5
 (Carried over.)

(Brought over.)

354000) 10526782.5 (29.736 29.74
708000 4.38

3446782 Ans. \$34.12
3186000

2607825
2478000

(4)
128640 211 1298250
.03 1.20 1062000
38.592
1286.40 422 2362500
1324.992 211 2124000
253.20 253.20 tax 238500
[on polls.
1071.792 tax on estates.

\$
117273) 1071.792 (.0091392 tax on \$1 about.
1055457

The tax paid by

163350	\$	\$	\$	\$
117273	1 is	.009	by 60 is	.548
460770	2 "	.018	70 "	.64
351819	3 "	.027	80 "	.731
1089510	4 "	.037	90 "	.823
1055457	5 "	.046	100 "	.914
340530	6 "	.055	200 "	1.828
234546	7 "	.064	300 "	2.742
1059840	8 "	.073	400 "	3.656
1055457	9 "	.082	500 "	4.569
1583	10 "	.091	600 "	5.484
275	20 "	.183	700 "	6.398
4383	30 "	.274	800 "	7.311
	40 "	.366	900 "	8.225
	50 "	.457	1,000 "	9.139

\$1858

The tax on \$1,000 is 9.139

" " 800 " 7.311

" " 50 " .457

" " 8 " .073

16.980

1.20 poll tax.

Ans. \$18.18

SIMPLE FELLOWSHIP.

Lesson 154.

(1)

1000
1250

2250) 9450 (.42
9000

4500
4500

.42
1000

\$420.00 A's gain.

1250
.42

250
500

(2)

420
525

\$945 proof.

\$525.00 B's gain.

(3)

2500
2200
12000

16700) 6500.0 (.3892215
50100

149000
133600

154000
150800

37000
33400

36000
33400

26000
16700

93000
83500

9500

.3892215
2500

19461075
7784430

973.0537500

\$973.05 Wallace's [share.]

.3892215
2200

7784430
7784430

856.2873000

\$856.29 Clark's [share.]

.3892215
12000

7784430
3892215

4670.6580000

\$4,670.66 Shaw's share.

(4)

950			
800			
1750	300.0 (.171428	.171428	.171428
1750		950	800
12500		857140	137.142400
12250		1542852	
2500		162856600	
1750			
7500	\$162.86 A's		\$137.14 B's
7000	[share.		[share.
5000			
3500			
15000			
14000	\$787.14 A		\$667.86 B
1000	[saved.		[saved.

(5)

(6)

A paid $\frac{2}{3}$ of his own payment, and B $\frac{1}{3}$ as much.
Both paid $\frac{1}{3}$ as much as A.

14)1540(110 is $\frac{1}{3}$	110	110
14	9	5
14	A's \$990	B's \$550
14		
0		

(7)

5000			
3000			
2500			
10500	14950(1.4238095	1.4238095	1.4238095
10500		5000	3000
44500		7119.0475000	4271.4285000
42000			
25000	\$7,119.05 son's		\$4,271.43 oldest
21000	[share.		[daughter's share.
40000			
31500		1.4238095 •	
85000		2500	
84000		71190475	
100000		28476190	
94500		3559.5237500	
55000			
52500		3,559.52 youngest daughter's	
2500		[share.	

COMPOUND FELLOWSHIP.

<p>(8)</p> $\begin{array}{r} 2825.16 \\ 275.16 \\ \hline 80) 2550.00 \\ \hline 31875 \\ 2 \\ \hline \end{array}$ <p>Ans. \$63.750</p>	<p>(9)</p> $\begin{array}{r} 80) 1000 \\ \hline 12.5 \\ 2 \\ \hline \end{array}$ <p>Ans. \$25.0</p>
---	---

(10)

	5000	2000	3000	4000
14000) 56000 (.4)	.4	.4	.4	.4
56000	<u>2000.0</u>	<u>800.0</u>	<u>1200.0</u>	<u>1600.0</u>
	[A's share.]	[B's.]	[C's.]	[D's.]

COMPOUND FELLOWSHIP.

Lesson 155.

<p>(1)</p> $\begin{array}{r} 400 \\ 6 \\ \hline 2400 \end{array}$	$\begin{array}{r} 450 \\ 8 \\ \hline 3600 \end{array}$			
$\begin{array}{r} 2400 \\ 3600 \\ 6000) 12000 (.02) \\ \hline 12000 \end{array}$	<p>(2)</p> $\begin{array}{r} 2400 \\ .02 \\ \hline \end{array}$	$\begin{array}{r} 3600 \\ .02 \\ \hline \end{array}$	$\begin{array}{r} 48 \\ 72 \\ \hline \end{array}$	
	\$48.00 A's [share.]	\$72.00 [B's share.]	\$120 proof.	
	<p>(3)</p> $\begin{array}{r} 2000 \\ 7 \\ \hline 14000 \end{array}$	$\begin{array}{r} 3000 \\ 5 \\ \hline 15000 \end{array}$	$\begin{array}{r} 4000 \\ 4 \\ \hline 16000 \end{array}$	
$\begin{array}{r} 14000 \\ 15000 \\ 16000 \\ 45000) 15000 (.0333 \&c. \\ \hline 135 \text{ or } .03\frac{1}{3} \\ \hline 150 \\ 135 \\ \hline 15 \end{array}$	<p>(Carried over.)</p>			

(Brought over.)

14000	15000	16000
.03 $\frac{1}{4}$	.03 $\frac{1}{4}$	.03 $\frac{1}{4}$
<hr/>	<hr/>	<hr/>
420.00	450.00	480.00
46.666	50	53.333
<hr/>	<hr/>	<hr/>
466.666	\$500 Adams's	533.333
\$466.67 Jones's share.	[share.]	\$533.33 Stevens's
		[share.]

(4)

3000	1000	500
12	9	4
<hr/>	<hr/>	<hr/>
36000	9000	2000
	36000	36000
	<hr/>	<hr/>
	A 45000	B 38000
	45000	
	38000	
	<hr/>	
	83000	\$ $\frac{2000}{38000}$ for \$1.

45000
2000

38000
2000

83|000)90000|000(1084.337

83|000)76000|000(915.66 B's
[dividend.]

83 \$1,084.34 A's divi-
[dend.]

700
664

130
83

360
332

470
415

280
249

(5)

550
498

310
249

6 4)4
.5

520
498

610
581

1
3.0
1
4)36
9 3
9

22

29

A \$27 B \$9

T

		(6)	
A 12	9	$\frac{1}{2}$ of $\frac{3}{4}$	
	3	or $\frac{1}{2}$ or $\frac{3}{4}$	
	4)27		
	B 6.75	6	
		3	
12		5)18	
6.75	12	C 3.6	
3.6	3000		
<u>22.35</u>			
\$ 22.35 for 1	2235) 36000.00	(1610738	
	2235	\$ 1,610.74 A's share.	
	13650		
	13410		
	<u>2400</u>		
	2235		
	<u>16500</u>		
	15645		
	<u>8550</u>		
	6705		
	<u>18450</u>		
	18080		
	<u>370</u>		
6.75		3.6	
3000		3000	
2235) 20250.00	(906.04 B's	2235) 10800.00	(483.22
20115	[share.	8940	[C's share.
<u>13500</u>		<u>18600</u>	
13410		17880	
<u>9000</u>		<u>7200</u>	
8940		6705	
<u>60</u>		<u>4950</u>	
		4470	
		<u>4800</u>	
		4470	
		<u>330</u>	

(7)

5000	5000	3000	3000
4	3000	5	4000
<hr/>	<hr/>	<hr/>	<hr/>
20000	2000	15000	7000
12000	6	21000	3
<hr/>	<hr/>	<hr/>	<hr/>
A 32000	12000	B 36000	21000

32|000

36|000

68|000

68)1768(26
136

408

408

26

32

52

78

\$ 832

A's share.

26

36

156

78

\$ 936

B's share.

INSURANCE.

Lesson 157.

(1)

3800

.01

38.00

2

3)76

Ans. \$ 25.33½

(2)

2000

5

5000

.02

 $\frac{5000}{8000}$ or $\frac{5}{8}$ of the brig
[is insured.

8)10000

1250

100

Ans. \$ 1,150

(3)

5000)37500(.0075 or .75 per cent. Ans.

3500

2500

2500

(4)

.03

.04

.06

.13

9000

Ans. \$ 1,170.00

1.00
.05

(6)

.95) 8000.00 (8421.05
760 .05

400 421.0525

380 \$421.05 Ans.

8421.05

421.05

200

190

\$8000.00 proof.

100

95

(7)

10000

.04

500

475

Ans. \$400.00 prem.

10000

400

25

\$9600 sum cov-
[ered.]

.03
.0025
.005
.0375

(8)

1.00
.0375

.9625) 8000.0000 (8311.688
77000 .03

30000

24935064

28875

\$249.35 Ans.

11250

9625

16250

9625

66250

57750

85000

77000

80000

77000

3000

(9)

.01) 88.10

\$8,810 sum insured.

88.10

\$8721.70 sum
covered.

GENERAL AVERAGE.

Lesson 159.

(1)

61000) 3237.00 (.0530655 to be paid
305000 by \$1

.0530655
16000

187000
183000

3183930
530655

400000
306000

8490480000

\$849.05

340000
305000

L. Murdock.

350000
305000

45000

.0530655
8250

.0530655
15000

.0530655
11000

2653275
1061310
4245240

2653275
530655

530655
530655

795.9825000

583.7205000

437.7903750

\$795.98

\$583.72

\$437.79

Daniel Drake.

T. Jones.

John Williams.

.0530655
10750

Proof.

2653275
3714585
530655

849.05
437.79
795.98
583.72
570.46

570.4541250

3237.00

570.45

Add 1 to balance frac-
\$570.46 [tions lost.

S. Hyde.

(2)		
10000 vessel.	7000	3) 1050
<u>1350</u>	<u>.03</u>	<u>350</u> — $\frac{1}{3}$ of freight.
8650	210.00 premium.	<u>2</u>
<u>700</u>	1140 - - damage.	<u>700</u> — $\frac{2}{3}$
9350	1350	
9000 A's goods.	5000 B's goods.	12800 C's goods.
<u>.02$\frac{1}{2}$</u>	<u>.02$\frac{1}{2}$</u>	<u>.02$\frac{1}{2}$</u>
18000	10000	25600
<u>4500</u>	<u>2500</u>	<u>6400</u>
225.00 premium.	125.00 premium.	320.00 premium.
300 - damage.	319 - freight.	586.50 damage.
<u>300 - freight.</u>	<u>444</u>	<u>256 - freight.</u>
825	5000	1162.50
9000	<u>444</u>	12800
<u>825</u>	4556	<u>1162.50</u>
8175		11637.50

8750 C's goods.	9350	
<u>.02$\frac{1}{2}$</u>	8175	
17500	4556	
<u>4375</u>	11637.50	
218.75 premium.	<u>8356.25</u>	
175 - freight.	42074.75)	378.67000 (.009 to be
<u>393.75</u>		37867275 [paid by \$1

8750
393.75
8356.25

9350	8175	4556	11637.5	8356.25
<u>.009</u>	<u>.009</u>	<u>.009</u>	<u>.009</u>	<u>.009</u>
\$84.150	73.575	41.004	104.7375	75.20625
Owner of the	\$73.57	\$41	\$104.74	\$75.21
[barque.	A	B	C	D

Proof.
84.15
73.57
41
104.74
75.21
\$378.67

ALLIGATION MEDIAL.

Lesson 160.

(1)

	.80	1	1.30	1.40
	4	6	8	10
	<u>3.20</u>	<u>6</u>	<u>10.40</u>	<u>14.00</u>
4	3.20			
6	6.			
8	10.40			
10	14.			
<u>28</u>	<u>33.60</u>			
	28			
	<u>56</u>			

Ans. 1.20

(2)

	200	400	500
	.06	.08	.10
	<u>12.00</u>	<u>32.00</u>	<u>50.00</u>
200	12		
400	32		
500	50		
<u>1100</u>	<u>94</u>		

Ans. \$8.55

(4)

18	19	24
9	10	7
<u>162</u>	<u>190</u>	<u>168</u>

(3)

1000 | 0855

\$.0855 or 8½ cts.
[about Ans.]

9	162
10	190
7	168
<u>26</u>	<u>520</u>
	52
	<u>0</u>

Ans. 20

		(5)	
		lb.	oz.
	18	2	10
	11	12	
	<hr/>	<hr/>	
	18	24	
	18	10	
	<hr/>	<hr/>	
	198	34	oz.
		20	
11		<hr/>	
34	198		
8	680	680	
3	192		
<hr/>	<hr/>		
56	56)	1070	(19 $\frac{2}{3}$ Ans.
		56	

(6)

$$\begin{array}{r} 1 \\ 60 \\ \hline 60 \\ .15 \\ \hline 30 \\ 6 \\ \hline 9.00 \\ 60 \\ \hline 75 \end{array} \quad \begin{array}{r} 75) 69.0 \\ 675 \\ \hline 150 \\ 150 \\ \hline \end{array} \quad \begin{array}{l} \$ \\ .92 \text{ Ans.} \end{array}$$

	lbs.	oz.	oz.	pwt.	
	5	3	10	1	
	12			20	1
	60				10.05 oz.
	3				[fine.
	63	oz.		12	
	10.05			3	lbs.
	315			36	oz.
63	63			12	
36	633.15			72	
9	432			36	
108	1065.15	(9 oz.		432	
	972				

10)10	12)9.0	(7)	20)15	1863.00	20
<u>1</u>	<u>84</u>		<u>.25</u>	1863.00	(17 pwts.
	60			108	
1.		(8)		783	
10 .75		12		756	
9 .25		1		27	
<u>5</u>		<u>1</u>		24	
24 2.00		11 oz. fine.		108	
				54	
24 $\frac{2}{4}$ or $\frac{1}{2}$				648	(6 grs.
Ans.				648	

ALLIGATION ALTERNATE.

Lesson 161.

$$\begin{array}{r} 50 \\ 45 \\ \hline 5 \end{array} \quad (2)$$

$$\begin{array}{r} 62 \\ 50 \\ \hline 12 \end{array}$$

Ans. 12 at 45 cts., and 5 at 62 cts.

$$\begin{array}{r} 20 \\ 19 \\ \hline 1 \end{array} \quad (3) \quad \begin{array}{r} 19 \\ 17 \\ \hline 2 \end{array}$$

Ans. 2 oz. 20 carats fine, and 1 oz. 17 carats fine.

$$\begin{array}{r} \frac{1}{120}, \frac{1}{120}, \text{ and } \frac{1}{120} \\ \text{changing to a common denominator,} \\ \frac{15}{120}, \frac{10}{120}, \text{ and } \frac{10}{120} \\ 15 \quad 10 \\ 10 \quad 8 \\ \hline 5 \quad 2 \\ \frac{5}{120} \quad \frac{2}{120} \end{array} \quad (4)$$

$$\begin{array}{r} 2 \quad 1\frac{1}{2} \\ 1\frac{1}{2} \quad 0 \\ \hline \frac{1}{2} \quad 1\frac{1}{2} \end{array} \quad (5)$$

Ans. $1\frac{1}{2}$ of rum to $\frac{1}{2}$ of water, or multiplying both numbers by 2, 3 of rum to 1 of water.

Ans. in the proportion of $\frac{2}{120}$ to $\frac{1}{120}$
changing to a simpler form, $\frac{2}{30}$ to $\frac{1}{15}$
multiplying both numbers by 120, 2 to 5

$$\begin{array}{r} 23 \\ 20 \\ \hline 3 \end{array} \quad (6) \quad \begin{array}{r} 20 \\ 0 \\ \hline 20 \end{array}$$

Ans. 20 of gold to 3 of alloy.

$$\begin{array}{r} 10 \\ 5 \\ \hline 5 \end{array} \quad (7) \quad \begin{array}{r} 23 \\ 10 \\ \hline 13 \end{array}$$

Ans. 13 oz. of 5 per cent. copper, and 5 oz. of 23 per cent. copper.

Lesson 162.

$$\begin{array}{r} 20 \\ 16 \\ \hline 4 \end{array} \quad (2) \quad \begin{array}{r} 23 \\ 20 \\ \hline 3 \end{array}$$

3 of 16 and 4 of 23

$$\begin{array}{r} 20 \\ 18 \\ \hline 2 \end{array} \quad \begin{array}{r} 23 \\ 20 \\ \hline 3 \end{array}$$

3 of 18 and 2 of 23

$$\begin{array}{r} 20 \\ 19 \\ \hline 1 \end{array} \quad \begin{array}{r} 23 \\ 20 \\ \hline 3 \end{array}$$

3 of 19 and 1 of 23

(3)
 $\frac{1}{12}, \frac{1}{16}, \frac{1}{20}, \text{ and } \frac{1}{23}$
multiplying by 12; $\frac{12}{12}, \frac{12}{16}, 1, \text{ and } \frac{12}{23}$
multiplying by 2; $3, \frac{24}{16}, 2, \text{ and } \frac{24}{23}$
multiplying by 5; $15, 12, 10, \text{ and } \frac{120}{23} \text{ or } 13\frac{1}{2}$
multiplying by 3; $45, 36, 30, \text{ and } 40$

$$\begin{array}{r} 45 \\ 40 \\ \hline 5 \end{array} \quad \begin{array}{r} 40 \\ 36 \\ \hline 4 \end{array}$$

4 of $\frac{1}{12}$ alloy and 5 of $\frac{1}{16}$

$$\begin{array}{r} 45 \\ 40 \\ \hline 5 \end{array} \quad \begin{array}{r} 40 \\ 30 \\ \hline 10 \end{array}$$

10 of $\frac{1}{12}$ alloy and 5 of $\frac{1}{23}$

(4)

$$\begin{array}{r}
 24 \\
 22 \\
 \hline
 2
 \end{array}
 \qquad
 \begin{array}{r}
 22 \\
 17 \\
 \hline
 5
 \end{array}$$

5 of 24 carats with 2 of 17

$$\begin{array}{r}
 24 \\
 22 \\
 \hline
 2
 \end{array}
 \qquad
 \begin{array}{r}
 22 \\
 20 \\
 \hline
 2
 \end{array}$$

2 of 24 carats with 2 of 20

(5)

$$\begin{array}{r}
 280 \\
 175 \\
 \hline
 105
 \end{array}
 \qquad
 \begin{array}{r}
 175 \\
 160 \\
 \hline
 15
 \end{array}$$

15 at \$ 2.80 and 105 at \$ 1.60

$$\begin{array}{r}
 210 \\
 175 \\
 \hline
 35
 \end{array}
 \qquad
 \begin{array}{r}
 175 \\
 150 \\
 \hline
 25
 \end{array}$$

25 at \$ 2.10 and 35 at \$ 1.50

Lesson 163.

(1)

$$\begin{array}{r}
 100 \\
 80 \\
 \hline
 20
 \end{array}
 \qquad
 \begin{array}{r}
 112 \\
 100 \\
 \hline
 12
 \end{array}$$

12 at 80 and 20 at 112

$$\begin{array}{r}
 100 \\
 90 \\
 \hline
 10
 \end{array}
 \qquad
 \begin{array}{r}
 112 \\
 100 \\
 \hline
 12
 \end{array}$$

12 at 90 and 10 at 112

Both mixtures; 12 at 80, 12 at 90,
[and 30 at 112
12)30(2.5 times that at 80 to make [30 bu.
24
60
60

(2)

$$\begin{array}{r}
 23\frac{1}{2} \\
 20 \\
 \hline
 3\frac{1}{2}
 \end{array}
 \qquad
 \begin{array}{r}
 20 \\
 18 \\
 \hline
 2
 \end{array}$$

2 at 23½ and 3½ at 18

$$\begin{array}{r}
 20 \\
 19 \\
 \hline
 1
 \end{array}
 \qquad
 \begin{array}{r}
 21 \\
 20 \\
 \hline
 1
 \end{array}$$

1 at 19 and 1 at 21

2)8
—
4 times that at 23½ to make [8 oz.
3½
4

$$\begin{array}{r}
 4 \\
 2 \\
 \hline
 2 - \frac{1}{2}
 \end{array}$$

8 oz. at 23½ carats, 14 oz. at 18 carats, 4 oz. at 19 carats, and 4 oz. at 21 carats, Ans.

$$\begin{array}{r}
 12 \\
 2.5 \\
 \hline
 60
 \end{array}
 \qquad
 \begin{array}{r}
 12 \\
 2.5 \\
 \hline
 60
 \end{array}
 \qquad
 \begin{array}{r}
 30 \\
 2.5 \\
 \hline
 15
 \end{array}$$

24 24 6

30.0 bu. at [80 cts. 30.0 bu. at [90 cts. 75.0 bu. at [112 cts. Ans.

(3)

$$\begin{array}{r}
 3 \\
 1\frac{1}{2} \\
 \hline
 1\frac{1}{2} \\
 1\frac{1}{2} \\
 1\frac{1}{2} \text{ at } 3 \text{ and } 1\frac{1}{2} \text{ at } 0 \\
 2 \\
 1\frac{1}{2} \\
 \hline
 \frac{1}{2} \\
 1\frac{1}{2} \text{ at } 2 \text{ and } \frac{1}{2} \text{ at } 0
 \end{array}
 \qquad
 \begin{array}{r}
 1\frac{1}{2} \\
 0 \\
 \hline
 1\frac{1}{2} \\
 1\frac{1}{2} \\
 0 \\
 \hline
 1\frac{1}{2}
 \end{array}$$

Both mixtures; $1\frac{1}{2}$ at 3, $1\frac{1}{2}$ at 2, and 2 at 0

$$2)10$$

$\frac{5}{5}$ times that at 0 to make 10 gals.

$$\begin{array}{r}
 1\frac{1}{2} \\
 5 \\
 \hline
 5 \\
 2\frac{1}{2} - \frac{1}{2} \\
 \text{Ans. } 7\frac{1}{2} \text{ gals. at } \$3 \text{ and } 7\frac{1}{2} \text{ gals. at } \$2, \text{ with } 10 \text{ gals. at } \$0
 \end{array}$$

(4)

$$\begin{array}{r}
 15 \\
 5 \\
 \hline
 20 \\
 2)0 \quad \begin{array}{r} 15 \\ 30 \\ \hline 180 \end{array} \\
 9 \text{ cts. a lb.}
 \end{array}$$

$$\begin{array}{r}
 10 \\
 9 \\
 \hline
 1
 \end{array}$$

1 at 9 and 1 at 11

$$\begin{array}{r}
 10 \\
 9 \\
 \hline
 1
 \end{array}$$

5 at 9 and 1 at 15

Both mixtures; 6 at 9, 1 at 11, and
[1 at 15

$$6)20$$

$3\frac{1}{3}$ times that at 9 to make 20
[lbs.

$$\begin{array}{r}
 6 \\
 3\frac{1}{3} \\
 \hline
 18 \\
 2 - \frac{1}{3} \\
 \hline
 20 \text{ lbs. at } 9 \text{ cts., } 3\frac{1}{3} \text{ lbs. at } 11 \text{ cts.,} \\
 \text{[and } 3\frac{1}{3} \text{ lbs. at } 15 \text{ cts., Ans.}
 \end{array}$$

$$\begin{array}{r}
 2 \\
 5 \\
 \hline
 5
 \end{array}$$

(5)

$$\begin{array}{r}
 16 \\
 6 \\
 \hline
 96 \\
 6 \\
 \hline
 102 \\
 16)316(19\frac{1}{2} \text{ carats.} \\
 16 \\
 \hline
 156 \\
 144 \\
 \hline
 12 \\
 4)12(\frac{3}{2} \\
 20 \\
 19\frac{1}{2} \\
 \hline
 \frac{1}{2} \\
 1 \text{ at } 19\frac{1}{2} \text{ and } \frac{1}{2} \text{ at } 21
 \end{array}$$

16 times that at $19\frac{1}{2}$ to make 16
[lbs.

$$\begin{array}{r}
 4)16 \\
 16 \text{ oz. at } 19\frac{1}{2} \text{ carats. } 4 \text{ oz. at } 21 \\
 \text{[carats, Ans.}
 \end{array}$$

		(6)			
	10	oz.	pwts.	oz.	pwts.
	8	9	14	11	10
	<u>80</u>	20	14	20	10
8	80	9.7 oz. fine.		11.5 oz. fine.	
10	97	10		2	
2	23	<u>97.0</u>		<u>23.0</u>	
20	20	oz.	pwts.		
	<u>200</u>	11	4		
	10	20	14		
20 ounces 10 oz. fine.		11.2 oz. fine.			

11	11.2	11	12
<u>10</u>	<u>11</u>	<u>10</u>	<u>11</u>
1	.2	1	1
.2 at 10 and 1 at 11.2		1 at 10 and 1 at 12	

Both mixtures; 1.2 at 10, 1 at 11.2, and 1 at 12

1.2) 20.0 (16.666 &c. or $16\frac{2}{3}$ times that at 10 to make 20 ounces; and of course $16\frac{2}{3}$ oz. at 11.2 oz. or 11 oz. 4 pwts. fine, and $16\frac{2}{3}$ oz. of pure silver, Ans.

$$\begin{array}{r}
 12 \\
 \hline
 80 \\
 72 \\
 \hline
 80 \\
 72 \\
 \hline
 8
 \end{array}$$

		(7)			
50	60	50	70		
<u>40</u>	<u>50</u>	<u>40</u>	<u>50</u>		
10	10	10	20		
10 at 40 and 10 at 60		20 at 40 and 10 at 70			

Both mixtures; 30 at 40, 10 at 60, and 10 at 70.

$$\begin{array}{r}
 30 \\
 10 \\
 10 \\
 \hline
 50
 \end{array}
 \begin{array}{r}
 40.0 \\
 (.8 \text{ times each make } 40) \\
 400
 \end{array}$$

Ans. $2\frac{3}{4}$ bu. at 40 cts., 8.0 at 60 cts., and 8.0 at 70 cts.

(8)

$$\begin{array}{r} 21 \\ 18\frac{1}{2} \\ \hline 2\frac{1}{2} \end{array} \quad \begin{array}{r} 23 \\ 21 \\ \hline 2 \end{array}$$

2 at $18\frac{1}{2}$ and $2\frac{1}{2}$ at 23

$$\begin{array}{r} 21 \\ 20 \\ \hline 1 \end{array} \quad \begin{array}{r} 23 \\ 21 \\ \hline 2 \end{array}$$

2 at 20 and 1 at 23

Both mixtures; 2 at $18\frac{1}{2}$, 2 at 20,
[and $3\frac{1}{2}$ at 23

$$\begin{array}{r} 2 \\ 2 \\ 3\frac{1}{2} \\ \hline 7\frac{1}{2} \\ \text{or } 7\frac{1}{2} \end{array} \quad \begin{array}{r} 12 \\ 2 \\ \hline 10 \end{array}$$

15)24 (1.6 times each to
[make 12 oz.

$$\begin{array}{r} 90 \\ 90 \end{array}$$

$\begin{array}{r} 2 \\ 1.6 \\ \hline 12 \\ 2 \\ \hline 3.2 \text{ or } 3\frac{1}{2} \end{array}$	$\begin{array}{r} 2 \\ 1.6 \\ \hline 12 \\ 2 \\ \hline 3.2 \text{ or } 3\frac{1}{2} \end{array}$	$\begin{array}{r} 3.5 \\ 1.6 \\ \hline 210 \\ 35 \\ \hline 5.6 \text{ or } 5\frac{1}{2} \end{array}$
3½ oz. 18½,	3½ oz. 20,	and 5½ oz.
[23 carats, Ans.		

(9)

$$\begin{array}{r} 3 \\ 1\frac{1}{2} \\ \hline 1\frac{1}{2} \end{array} \quad \begin{array}{r} 1\frac{1}{2} \\ 0 \\ \hline 1\frac{1}{2} \end{array}$$

$1\frac{1}{2}$ at 3 and $1\frac{1}{2}$ at 0

$$\begin{array}{r} 2 \\ 1\frac{1}{2} \\ \hline \frac{1}{2} \end{array} \quad \begin{array}{r} 1\frac{1}{2} \\ 1\frac{1}{2} \text{ or } 1\frac{1}{2} \\ \hline \frac{1}{2} \end{array}$$

$\frac{1}{2}$ at 2 and $\frac{1}{2}$ at $1\frac{1}{2}$

$$\begin{array}{r} 1\frac{1}{2} \text{ or } \frac{1}{2} \\ 1\frac{1}{2} \text{ or } \frac{1}{2} \\ \hline \frac{1}{2} \\ \frac{1}{2} \\ \hline 3\frac{1}{2} \text{ or } 3\frac{1}{2} \text{ or } \frac{1}{2} \end{array}$$

dividing 20 by $\frac{1}{2}$

$$\begin{array}{r} 20 \\ 2 \\ \hline 40 \end{array}$$

40 times each to make 20

$$\begin{array}{r} 40 \text{ times } \frac{1}{2} \\ 7 \quad 7 \\ 4 \quad 40 \\ \hline 28 \quad 280 \end{array}$$

28)280 (10 gals. at
[\$3.

$$\begin{array}{r} 40 \text{ times } \frac{1}{2} \\ 7 \quad 5 \\ 4 \quad 40 \\ \hline 28 \quad 200 \end{array}$$

28)200 (7½ gals. of
[water.

$$\begin{array}{r} 2\frac{1}{2} \text{ or } \frac{1}{2} \end{array}$$

$$\begin{array}{r} 40 \text{ times } \frac{1}{2} \\ 7 \quad 1 \\ 4 \quad 40 \\ \hline 28 \quad 40 \end{array}$$

28)40 (1½ gal. at \$2
and 1½ gal.
at \$1½.
4)12 (3

PROMISCUOUS QUESTIONS

IN

RULE OF THREE, FELLOWSHIP, INSURANCE, &c.

Lesson 165.

(1)

1.00

.04.96) 5000.00 (5208.3333 &c.

480 Ans. I must insure

\$5,208.33 $\frac{1}{2}$ 200

192

800

768

320

288

320

288

32

(3)

80) 350

\$4375 a thousand.

33

13125

13125

144375Ans. \$14437 $\frac{1}{2}$

(4)

8

71 man can do it in 56 days.

14) 56 (4 Ans.

56

(5)

The rice is bartered at $\frac{1}{4}$ its value.

1

54) 5

Ans. \$1.25

5208.333 &c.

.0420833333 &c.\$20833 $\frac{1}{2}$ premium.

(2)

\$ ~~2.20~~ ^{2.20} for the use of \$1,
[9 mo.

80

9720\$ ~~4.20~~ ^{4.20} for the use of \$1,
[1 mo.

390

1139

39

42.90\$ ~~42.80~~ ^{42.80} for the use of \$1,
[11 mo.

42.90

375

2145

3003

1287

1287

16087.50

1440

1687

1440

2475

2160

3150

2880

270

(6)

$$\begin{array}{r} 1\frac{1}{4} \text{ time } 6\frac{3}{8} \\ \text{or } \frac{1}{4} \text{ time } 5\frac{1}{8} \\ 4 \quad 51 \\ 8 \quad 7 \\ \hline 32 \quad 357 \\ \quad \quad 357 \text{ sq. yds. in} \\ \quad \quad 32 \text{ 1st piece.} \end{array}$$

$$\begin{array}{r} 25.50 \\ 32 \end{array}$$

$$\begin{array}{r} 510 \\ 765 \end{array}$$

$$\begin{array}{r} 816.0 \end{array}$$

\$ 816 a sq. yd.; divide by $5\frac{1}{8}$ sq. yds. in 2d piece.

$$\begin{array}{r} 357 \\ 8 \end{array}$$

$$\begin{array}{r} 2856 \end{array}$$

(7)

$$\begin{array}{r} 10) 1859 \\ \hline 185.9 \quad 185.9 \\ \quad 6 \quad 4 \\ \hline \text{A's } \$ 1,115.40, \text{ B's } \$ 743.60 \\ \text{[Ans.} \end{array}$$

$$\begin{array}{r} 11 \\ 5 \end{array}$$

$$\begin{array}{r} 55 \end{array}$$

$$\begin{array}{r} 816 \\ 55 \end{array}$$

$$\begin{array}{r} 4080 \\ 4080 \end{array}$$

$$\begin{array}{r} 2856) 44880 (15.71 \text{ Ans.} \\ 2856 \end{array}$$

(8)
A can do $\frac{1}{8}$ and B $\frac{1}{8}$ of it a day.
or $\frac{6}{36}$ and $\frac{4}{36}$

Both can do $\frac{10}{36}$ of it a day.

$$\begin{array}{r} 10) 36 (3\frac{2}{5} \text{ days, Ans.} \\ 30 \end{array}$$

$$\begin{array}{r} 2) \frac{6}{15} (\frac{2}{5} \end{array}$$

$$\begin{array}{r} 16320 \\ 14280 \end{array}$$

$$\begin{array}{r} 20400 \\ 19992 \end{array}$$

$$\begin{array}{r} 4080 \\ 2856 \end{array}$$

$$\begin{array}{r} 1224 \end{array}$$

(9)

$$\begin{array}{r} 500) 2000 \\ \hline \end{array}$$

Ans. 4 yrs.

(10)

$$\begin{array}{r} 1.50 \\ 3 \end{array}$$

$$\begin{array}{r} \$4.50 \text{ a C.} \\ 3\frac{1}{8} \end{array}$$

$$\begin{array}{r} 13.50 \\ 75 \end{array}$$

Ans. \$ 14.25

Lesson 166.

(1)

T. cwt. qrs.
85 6 3

4) 3.0

2|0) 6.75

85.3375

~~85.3375~~ T., what
6627 [\$1 will buy.

85.3375
453.33

(2)

4000
.02

80.00

4000 180 polls.

2

4080

360

360

3720 tax on estates.

\$ ~~2722~~ tax on \$1
200000

3000

185

3185 A's estate.

3720

6370

22295

9555

200000) 11848200 (59.24

1000000

1848200

1800000

482000

400000

820000

800000

2560125

2560125

2560125

4266875

3413500

6627) 38686.048875 (5 T.
33135

5551.048875 or ~~5551.048875~~ T.
20

) 111020.977500 (16.7528

6627

or 16 $\frac{1}{2}$ cwt. a-
[bout.

44750

39762

49889

46389

35007

33135

18727

13254

54735

53016

1719

59.24

2

\$ 61.24

[Ans.

(3)

$$\begin{array}{r} 5 \\ 2 \\ 3 \overline{)10} (3 \text{ h.} \\ 9 \\ \hline 1 \\ 60 \\ \hline 60 (20 \text{ m.} \\ 6 \\ \hline 0 \end{array}$$

(4)

or $\frac{1}{10}$ of $\frac{1}{5}$ or $\frac{1}{5}$ of $\frac{1}{10}$

$$\begin{array}{r} 8 \overline{)840} \\ 105 \end{array} \quad \begin{array}{r} 105 \overline{)656.25} (\\ 630 \\ \hline 262 \\ 210 \\ \hline 525 \\ 525 \end{array} \quad \begin{array}{r} 6.25 \text{ an acre.} \\ 30 \\ \hline \$187.50 \text{ Ans.} \end{array}$$

(5)

$$\begin{array}{r} 20 \\ 18 \\ \hline 2 \end{array} \quad \begin{array}{r} 22 \\ 20 \\ \hline 2 \end{array}$$

2 at 18 and 2 at 22

$$\begin{array}{r} 20 \\ 19 \\ \hline 1 \end{array} \quad \begin{array}{r} 22 \\ 20 \\ \hline 2 \end{array}$$

2 at 19 and 1 at 22

Both mixtures 2 at 18, 2 at 19, and 3 at 22

$$\begin{array}{r} 2 \\ 2 \\ 3 \\ \hline 7 \end{array}$$

Ans. $\frac{2}{7}$ lb. 18 carats, $\frac{2}{7}$ lb. 19 carats, and $\frac{3}{7}$ lb. 22 carats.

(6)

lbs.	oz.	lb.	oz.	pwt.
2	3	1	10	10
12		or 12 oz.		
		10.5	20	10
24				
3		60		10.5 oz.
		12		
27				
11		1260		
27				
27				
297				

(Carried over.)

(Brought over.)

	(7)
27 297	1000 4000 2500
12 126	12 8 10
40 40) 423 (10 oz.	12000 32000 . 25000

40	12000
<hr/>	32000
23	25000
20	<hr/>
<hr/>	69000
) 460 (11 pwts.	

69) 2000 (28.9855
138

620
552

680
621

590
552

380
345

350
345

5

$$\begin{array}{r} 1.00 \quad (8) \\ .025 \\ \hline .975 \end{array} \begin{array}{r} 600.000 \\ 5850 \end{array} \begin{array}{r} 615.38 \text{ Ans.} \end{array}$$

1500			
<u>975</u>	289855	289855	289855
	12	32	25
5250			
<u>4875</u>	579710	579710	1449275
	289855	869565	579710
<u>3750</u>			
2925	3478260	9275360	7246375
<u>8250</u>	\$347.82	\$927.54	\$724.64
7800	A's share.	B's share.	C's share.
<u>450</u>			

MENSURATION.

Lesson 169.

<p>(1)</p> $\begin{array}{r} 51.75 \\ 32.5 \\ \hline 25875 \\ 10350 \\ 15525 \\ \hline 1681875 \text{ sq. ft.} \\ .55 \\ \hline 8409375 \\ 8409375 \\ \hline 92503125 \end{array}$ <p>Ans. \$925.03</p>	<p>(2)</p> $\begin{array}{r} 60 \\ 60 \\ \hline 40) 3600 \\ \hline 4) 90 \\ \hline 22.5 \\ \text{or } 22\frac{1}{2} \\ \text{[Ans.} \end{array}$	<p>(3)</p> $\begin{array}{r} 18.67 \\ 1.25 \\ \hline 9335 \\ 3734 \\ \hline 1867 \\ \hline 233375 \\ \text{or } 23\frac{1}{2} \text{ sq. ft.} \\ \text{[about Ans.} \end{array}$																			
•																					
<p>(4)</p> $\begin{array}{r} 27\frac{1}{2} \\ \text{or } 27.75 \\ .875 \\ \hline 13875 \\ 19425 \\ \hline 22200 \\ \hline 2428125 \end{array}$ <p>Ans. 24.28 about.</p>	<p>$\frac{1}{8}$</p> <p>8) 7.0 •</p> $\begin{array}{r} .875 \end{array}$	<p>(5)</p> $\begin{array}{r} 19.5 \\ 15 \\ \hline 975 \\ 195 \\ \hline 9) 2925 \\ \hline 325 \\ .10 \end{array}$ <p>Ans. \$3.250</p>																			
(6)																					
<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">ft. in.</td> <td style="text-align: center;">ft. in.</td> </tr> <tr> <td style="text-align: center;">5 9</td> <td style="text-align: center;">3 3</td> </tr> <tr> <td style="text-align: center;">ft.</td> <td style="text-align: center;">ft.</td> </tr> <tr> <td style="text-align: center;">or 5.75</td> <td style="text-align: center;">or 3.25</td> </tr> <tr> <td style="text-align: center;">3.25</td> <td></td> </tr> </table> $\begin{array}{r} 2875 \\ 1150 \\ \hline 1725 \\ \hline 186875 \\ 12 \text{ windows.} \\ \hline 373750 \\ 186875 \\ \hline 2242500 \end{array}$	ft. in.	ft. in.	5 9	3 3	ft.	ft.	or 5.75	or 3.25	3.25		<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">ft. in.</td> <td style="text-align: center;">ft. in.</td> </tr> <tr> <td style="text-align: center;">5 3</td> <td style="text-align: center;">3 2</td> </tr> <tr> <td style="text-align: center;">ft.</td> <td style="text-align: center;">ft.</td> </tr> <tr> <td style="text-align: center;">or 5.25</td> <td style="text-align: center;">or 3.1666 &c.</td> </tr> <tr> <td style="text-align: center;">3 $\frac{1}{8}$</td> <td style="text-align: center;">or 3 $\frac{1}{8}$ ft.</td> </tr> </table> $\begin{array}{r} 15.75 \\ .875 - \frac{1}{8} \\ \hline 16.625 \\ 7 \text{ windows.} \\ \hline 116375 \end{array}$	ft. in.	ft. in.	5 3	3 2	ft.	ft.	or 5.25	or 3.1666 &c.	3 $\frac{1}{8}$	or 3 $\frac{1}{8}$ ft.
ft. in.	ft. in.																				
5 9	3 3																				
ft.	ft.																				
or 5.75	or 3.25																				
3.25																					
ft. in.	ft. in.																				
5 3	3 2																				
ft.	ft.																				
or 5.25	or 3.1666 &c.																				
3 $\frac{1}{8}$	or 3 $\frac{1}{8}$ ft.																				

(Carried over.)

(Brought over.)

$$\begin{array}{r} 224.25 \\ 116.375 \\ \hline \end{array}$$

$$\begin{array}{r} 340.625 \\ .20 \\ \hline \end{array}$$

$$\begin{array}{r} 68.12500 \\ \hline \end{array}$$

or \$68.12½ Ans.

(7)

$$\begin{array}{r} \text{ft. in.} \\ 60 \text{ } 4 \text{ } 57 \\ \text{or } 60\frac{1}{2} \text{ ft. } 60\frac{1}{2} \end{array}$$

$$\begin{array}{r} 3420 \\ 19 - \frac{1}{2} \\ \hline \end{array}$$

$$\begin{array}{r} 100) 3439 \\ \hline \end{array}$$

$$\begin{array}{r} 3439 \\ .40 \\ \hline \end{array}$$

$$\begin{array}{r} 137560 \\ \text{Ans. } \$13.76 \end{array}$$

(8)

$$\begin{array}{r} \text{rods. ft.} \\ 16 \text{ } 9 \\ 16\frac{1}{2} \end{array}$$

$$\begin{array}{r} 96 \\ 16 \\ 8 - \frac{1}{2} \\ 9 \\ \hline \end{array}$$

$$\begin{array}{r} 273 \\ 82.5 \\ \hline \end{array}$$

$$\begin{array}{r} 1365 \\ 546 \\ \hline \end{array}$$

2184

$$\begin{array}{r} 22522.5 \\ \hline \end{array}$$

or 22,522½ sq. ft. Ans.

(9)

40½

or 40.5

$$\begin{array}{r} 16.5 \\ 5 \text{ rods.} \\ \hline \end{array}$$

$$\begin{array}{r} 82.5 \\ \hline \end{array}$$

2) 5

Ans. \$

(10)

$$\begin{array}{r} 35.6 \\ 91.4 \\ \hline \end{array}$$

$$\begin{array}{r} 127.0 \\ 10 \\ \hline \end{array}$$

2) 1270

Ans. 635 sq. ft.

(11)

$$\begin{array}{r} 8 \\ 13 \\ \hline \end{array}$$

$$\begin{array}{r} 2) 21 \\ 10.5 \\ \hline \end{array}$$

10.5

5

2

11

4) 28.5

$$\begin{array}{r} 7.125 \\ 40 \\ \hline \end{array}$$

$$\begin{array}{r} 285.000 \\ \hline \end{array}$$

Ans. 285 sq. ft.

(12)

3.141

$$\begin{array}{r} 157.07 \\ \hline \end{array}$$

$$\begin{array}{r} 78539 \\ \hline \end{array}$$

314159

2) 3926.98

$$\begin{array}{r} 196349.375 \\ \hline \end{array}$$

Ans. 196349 sq. ft. about.

Lesson 170.

<p style="text-align: center;">(1)</p> $ \begin{array}{r} 3.14159 \\ 12 \overline{) 628318} \\ 314159 \\ \hline 3769908 \\ 6 \\ \hline 2) 22619448 \\ \hline 2) 11309724 \text{ whole circle.} \\ \hline 5654862 \\ \text{Ans. } 56549 \text{ sq. ft. nearly.} \end{array} $	<p style="text-align: center;">(2)</p> $ \begin{array}{r} 3.14159 \\ 5.5 \overline{) 1570795} \\ 1570795 \\ \hline 17278745 \\ 2.75 \\ \hline 2) 5.5 \\ \hline 2.75 \end{array} $ $ \begin{array}{r} 86393725 \\ 120951215 \\ 34557490 \\ \hline 2) 4751654875 \\ \hline 4) 23758274375 \text{ whole circle.} \\ \hline 5.93956 \text{ \&c.} \\ \text{Ans. } 5.94 \text{ sq. rods, nearly.} \end{array} $
<p style="text-align: center;">(3)</p> $ \begin{array}{r} \text{ft. in.} \\ 18 \quad 9 \\ \text{or ft.} \\ 3.14159) 18.75000 (5.968 \text{ ft. about} \\ 1570795 \\ \hline 3042050 \\ 2827431 \\ \hline 2146190 \\ 1884954 \\ \hline 2612360 \\ 2513272 \\ \hline 99088 \end{array} $	<p style="text-align: center;">(4)</p> $ \begin{array}{r} 1 \\ 4 \overline{) 4} \\ \hline 4 \\ \hline 160 (10 \text{ rods, Ans.} \\ 16 \\ \hline 0 \end{array} $ <p style="text-align: center;">(6)</p> $ \begin{array}{r} 1 \\ 4 \overline{) 4} \\ 4 \\ \hline 40 \\ 160 \text{ sq. rods in 1 A.} \\ 2 \text{ A.} \\ \hline 320 \\ 2 \\ \hline 2) 0 \overline{) 640} \\ \text{Ans. } 32 \text{ rods.} \end{array} $
<p style="text-align: center;">(5)</p> $ \begin{array}{r} \text{ft. in.} \\ 12 \quad 6 \\ \text{ft.} \\ \text{or } 12.5) 225.0 (18 \text{ ft. Ans.} \\ 125 \\ \hline 1000 \\ 1000 \\ \hline \end{array} $	

(Brought over.)

224.25

116.375

340.625

.20

68.12500

or \$68.12½ Ans.

(7)

ft.	in.	
60	4	57
or 60½ ft.		60½

3420 •

19 — ½

100) 3439

3439

.40

137560

Ans. \$13.76

(8)

rods. ft.

16 9

16½

96

16

8 — ½

9

273

82.5

1365

546

2184

22522.5

or 22,522½ sq. ft. Ans.

(9)

40½

or 40.5

73½

1215

2835

2956.5

13.5 — ½

13.5 — ½

2) 2983.5

1491.75

.30

447.5250

Ans. \$447.52½

(10)

35.6

91.4

127.0

10

2) 1270

Ans. 635 sq. ft.

(11)

8

13

2) 21

10.5

10.5

5

2

11

4) 28.5

7.125

40

285.000

Ans. 285 sq. ft.

(12)

314159

50

15707950

25

7853975

3141590

2) 39269875

196349375

Ans. 1963.49 sq. ft. about.

Lesson 170.

<p>(1)</p> $\begin{array}{r} 3.14159 \\ 12 \\ \hline 628318 \\ 314159 \\ \hline 3769908 \\ 6 \\ \hline \end{array}$ <p>2) 226.19448</p> <p>2) 113.09724 whole circle.</p> <p>56.54862</p> <p>Ans. 56.549 sq. ft. nearly.</p>	<p>(2)</p> $\begin{array}{r} 3.14159 \\ 5.5 \\ \hline 1570795 \\ 1570795 \\ \hline 17278745 \\ 2.75 \\ \hline \end{array}$ <p>2) 5.5</p> <p>2.75</p> <p>86393725</p> <p>120951215</p> <p>34557490</p> <p>2) 47.51654875</p> <p>4) 23.758274375 whole circle.</p> <p>5.93956 &c.</p> <p>Ans. 5.94 sq. rods, nearly.</p>
--	--

<p>(3)</p> <p>ft. in.</p> <p>18 9</p> <p>or ft.</p> <p>3.14159) 18.75000 (5.968 ft. about</p> <p>1570795</p> <hr/> <p>3042050</p> <p>2827431</p> <hr/> <p>2146190</p> <p>1884954</p> <hr/> <p>2612360</p> <p>2513272</p> <hr/> <p>99088</p>	<p>(4)</p> <p>1</p> <p>4</p> <hr/> <p>4</p> <p>40</p> <hr/> <p>16) 160 (10 rods, Ans.</p> <p>16</p> <hr/> <p>0</p>
<p>(5)</p> <p>ft. in.</p> <p>12 6</p> <p>ft.</p> <p>or 12.5) 225.0 (18 ft. Ans.</p> <p>125</p> <hr/> <p>1000</p> <p>1000</p>	<p>(6)</p> <p>1</p> <p>4</p> <p>4</p> <p>40</p> <p>160 sq. rods in 1 A.</p> <p>2 A.</p> <hr/> <p>320</p> <p>2</p> <hr/> <p>2) 0) 640</p> <p>Ans. 32 rods.</p>

(7)

18	ft. in.	ft. in.
16	3 10	5 4
<hr/>	ft.	ft.
34	or 3.83 $\frac{1}{3}$	or 5 $\frac{1}{3}$ 3.5
2	7	5 $\frac{1}{3}$
<hr/>		<hr/>
68	26.81	17.5
10	2333 &c. — $\frac{1}{3}$	1.16666 &c. — $\frac{1}{3}$
<hr/>		<hr/>
680	26.83333 &c.	18.66666 &c.
	2	2
	<hr/>	<hr/>
	53.66666 &c.	37.33333 &c.
		25

$$\begin{array}{r} 3.83\frac{1}{3} \\ 2 \\ \hline \end{array}$$

$$\begin{array}{r} 7.66\frac{2}{3} \\ \text{or } 7\frac{2}{3} \\ 5 \\ \hline \end{array}$$

68 ft. circumference of the room.
 $12\frac{2}{3}$ $12\frac{2}{3}$

$55\frac{1}{3}$ 10 in. wide.
 or $16\frac{2}{3}$ ft. or $1\frac{2}{3}$ or $\frac{2}{3}$ ft. wide.

$$\begin{array}{r} 3 \\ 6 \\ \hline 18 \end{array} \quad \begin{array}{r} 166 \\ 5 \\ \hline \end{array}$$

$$18) 830 \text{ (46.11111 \&c.)}$$

$$\begin{array}{r} 72 \\ \hline \end{array}$$

$$\begin{array}{r} 110 \\ \hline \end{array}$$

$$\begin{array}{r} 108 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \hline \end{array}$$

$$53.66666 \text{ \&c.}$$

$$37.33333 \text{ \&c.}$$

$$25$$

$$46.11111 \text{ \&c.}$$

$$680$$

$$162.11111$$

$$9) 517.88888$$

$$57.5432$$

$$\text{Ans. } 57.543$$

(8)

26	32	41
8	25	13
<hr/>		
208	160	123
	64	41
<hr/>		
208		
800	800	533
533		
<hr/>		
2)1541	4	
<hr/>		
40)770.5	(19(4 A.	
40	16	
<hr/>		
370	3 qrs.	
360		
<hr/>		
10.5 sq. rods.		

(9)

ft.	in.
18	9
<hr/>	
ft.	
or 18.75	
20	
<hr/>	
375.00	
20.83333 &c.	
<hr/>	
9)354.16666 &c.	
<hr/>	
39.35185 &c.	
<hr/>	
Ans. 39.352 nearly.	

ft.	in.
4	2
<hr/>	
ft.	
or 4.16 $\frac{2}{3}$	
5	
<hr/>	
20.80	
<hr/>	
1666 &c. $\frac{1}{3}$	
1666 &c. $\frac{1}{3}$	
<hr/>	
20.83333 &c.	

(10)

yds.	yds.
26 $\frac{1}{2}$	times 1 $\frac{1}{2}$
or 19 $\frac{1}{4}$	times $\frac{3}{2}$
4	107
8	9
<hr/>	
32	963
<hr/>	
$\frac{3}{4}$	in 26 $\frac{1}{2}$
4)32	3)963
8	321
<hr/>	
2 $\frac{1}{2}$	8)321
<hr/>	
/Ans. 40 $\frac{1}{2}$ yds.	

(11)

6	
6	
<hr/>	
36 sq. miles.	
640	
<hr/>	
144	
216	
<hr/>	
23,040 acres.	

(12)

7	
19	
<hr/>	
2)26	
<hr/>	
13	
11	
5	
6	
16	
<hr/>	
5)51	
<hr/>	
10.2	
100	
<hr/>	
1020.0	
<hr/>	
Ans. 1,020 sq. ft.	

Lesson 173.

$$\begin{array}{r}
 \text{(1)} \\
 \text{ft. in.} \\
 6 \quad 6 \\
 \text{or } 6.5 \text{ ft.} \\
 6.5 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 325 \\
 390 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 4225 \\
 65 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 21125 \\
 25350 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 274.625
 \end{array}$$

Ans. $274\frac{1}{8}$

(2)

$$\begin{array}{r}
 4 \\
 4 \\
 \hline
 16 \\
 4 \\
 \hline
 \end{array}$$

64 cubic ft.

$$\begin{array}{r}
 16 \overline{) 64} \quad (4 \text{ ft. of wood.} \\
 64 \\
 \hline
 \end{array}$$

(3)

$$\begin{array}{r}
 \text{ft. in.} \quad \text{ft. in.} \\
 4 \quad 5 \quad 5 \quad 4
 \end{array}$$

$$\begin{array}{r}
 \text{ft.} \\
 \text{say } 4.4 \\
 8
 \end{array}$$

$$\begin{array}{r}
 \text{ft.} \\
 \text{say } 5.3
 \end{array}$$

$$\begin{array}{r}
 1 \\
 8 \\
 \hline
 8 \\
 16 \\
 \hline
 48 \\
 8 \\
 \hline
 128
 \end{array}$$

$$\begin{array}{r}
 35.2 \\
 5.3 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1056 \\
 1760 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 128 \quad 128 \overline{) 18656} \quad (1.4575 \text{ C.} \\
 128 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 585 \\
 512 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1.4575 \\
 6 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 736 \\
 640 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 8.7450 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \$8.74\frac{1}{2}
 \end{array}$$

$$\begin{array}{r}
 960 \\
 896 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 640 \\
 640 \\
 \hline
 \end{array}$$

(4)

$$\begin{array}{r}
 \text{C. ft.} \\
 5 \quad 5
 \end{array}$$

$$\begin{array}{r}
 8 \\
 40 \\
 5 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 45 \\
 16 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 20 \\
 4 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 270 \\
 45 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 80 \quad 80 \overline{) 720} \\
 \hline
 \end{array}$$

Ans. 9 ft.

(5)		(6)	
ft. in.	ft. in.	ft. in.	30.4
7 2	4 6	4 7	4
ft. say 7.2	ft. or 4.5	ft. say 4.6	121.6
4.5			4.3
360			3648
288			4864
32.40			8
4.6			16)522.88
			48 32
			42 68
			32 64
			108 40
			96 40
			128
			128
1944			
1296			
8			
16)149.04	(9.315 (1 C.		
144	8		
50	1.315 ft.		
48			
24			
16			
80			
80			

(7)		(8)	
ft. in.	ft. in.	ft. in.	
35 8	1 3	1 4	
ft.	ft.	ft.	
or 35½	or 1.25	or 1½	
	2	3	
	2.50	3	
	35½	1 — ½	
	125	2) 4	
	75	2	
	87.5	28	
	.8333 &c. ½	16	
	.8333 &c. ½	4	
	5)0.81666 &c.	Ans. 56	
	1.78333 &c.		
	9		
	16.04999 &c.		
	Ans. \$16.05		

		(9)		(10)
		35	22	
		20	30	
	1600	—	—	
40	15	15	660	
40	—		8	
—	80		—	cubic yds.
1600	16		27)5280	(195.555 &c. 195.555 &c.
20	—		27	.06
—	2)24000		—	—
32000	—		258	11.73333 &c.
12000	12000		243	Ans. \$ 11.73
—			—	
44,000	cubic ft. Ans.		150	
			135	

		(11)		(12)
		3.14159		3.14159
		4 ft. in diam.		4 ft. in diam.
		—		—
		12.56636		12.56636
		2		2
		—		—
		2)25.13272		2)25.13272
		—		—
		12.56636		12.56636
		5 5 in. or $\frac{5}{12}$ ft. [thick.		42
		—		—
		12)62.83180		25.13272
		60		5026544
		—		—
		28		5)0)52)7.78712
		24		—
		—		10.5557424
		43		Ans. 10.556 T. nearly.
		36		
		—		
		71		
		60		
		—		
		118		
		108		
		—		
		100		
		96		
		—		
		4		

Lesson 174.

$$\begin{array}{r}
 \text{(1)} \\
 \text{ft. in.} \\
 1 \quad 2 \\
 12 \\
 \hline
 12 \\
 2 \\
 \hline
 14 \\
 2\frac{1}{2} \\
 \hline
 28 \\
 7 - \frac{1}{2} \\
 \hline
 2)35 \\
 \hline
 17.5 \\
 3 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \text{(2)} \\
 1.25 \\
 1.5 \\
 \hline
 625 \\
 125 \\
 \hline
 1.875 \\
 20 \\
 \hline
 5)37.500 \\
 \hline
 .75 \\
 8 \\
 \hline
 \end{array}$$

Ans. \$ 6.00

Ans. 52.5 cubic in.

$$\begin{array}{r}
 \text{(4)} \\
 700 \\
 700 \\
 \hline
 490000 \\
 500 \\
 \hline
 3)245000000 \\
 27)81666666.66 \text{ \&c. } (3,024,691.358 \text{ cubic yds.} \\
 81 \\
 \hline
 66 \\
 54 \\
 \hline
 126 \\
 108 \\
 \hline
 186 \\
 162 \\
 \hline
 246 \\
 243 \\
 \hline
 36 \\
 27 \\
 \hline
 96 \\
 81 \\
 \hline
 156 \\
 135 \\
 \hline
 216 \\
 216 \\
 \hline
 6
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 3.14159 \quad \text{ft. in.} \\
 2.25 \quad 2 \quad 3 \\
 \hline
 1570795 \quad \text{ft.} \\
 628318 \quad \text{or } 2.25 \\
 628318 \quad 2)225 \\
 \hline
 7.0685775 \quad 1\frac{1}{8} \quad \text{or } 1\frac{1}{8} \\
 7.0685775 \\
 .8835721875 \\
 2)7.9521496875 \\
 \hline
 3.97607484375 \\
 41 \\
 \hline
 39760748 \\
 159042992 \\
 \hline
 163.0190668
 \end{array}$$

Ans. 163.019 cubic ft.

[about.]

$$\begin{array}{r}
 \text{(5)} \\
 21.25 \\
 18.33 \\
 \hline
 6375 \\
 6375 \\
 17000 \\
 2125 \\
 \hline
 3)389.5125 \\
 \hline
 \end{array}$$

Ans. 129.8375 cubic ft.

$$\begin{array}{r}
 \text{(6)} \\
 314159 \\
 \underline{12} \\
 628318 \\
 314159 \\
 \underline{37.69908} \\
 6 \\
 2) 226.19448 \\
 \underline{113.09724} \text{ sq. ft. surface} \\
 44.5 \text{ of base.} \\
 \underline{56548620} \\
 45238896 \\
 \underline{45238896} \\
 3) 5032827180 \\
 \underline{1677.60906} \\
 \text{Ans. } 1,677.609 \text{ cubic ft. about.}
 \end{array}$$

$$\begin{array}{r}
 \text{ft.} \quad \text{(7)} \\
 2.25 \quad 3.14159 \\
 \text{or } 2\frac{1}{4} \text{ ft.} \quad \underline{2\frac{1}{4}} \\
 628318 \\
 .7853975 \\
 \underline{7.0685775} \text{ circum.} \\
 2\frac{1}{4} \\
 141371550 \\
 \underline{1.767144375} \\
 2) 2\frac{1}{4} \quad 15904299375 \text{ sq. ft.} \\
 \underline{1\frac{1}{8}} \quad 1\frac{1}{8} \text{ surface.} \\
 15904299375 \\
 \underline{1.988037421875} \\
 3) 17.892336796875 \\
 \underline{5.9641112 \&c.} \\
 \text{Ans. } 5.964 \text{ cubic ft. about.}
 \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 1.5 \\
 .8 \\
 3.5 \overline{) 70} \text{ (.2 ft. contraction in rising 1 ft.} \\
 \underline{70} \\
 .2) 15.0 \\
 \underline{7.5} \text{ ft. to come to a point.} \\
 3.5 \\
 \underline{4.0} \text{ ft. height of little cone.} \\
 \text{Ans. } 1,898.655 \text{ cubic ft.}
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 18.5 \\
 11 \\
 \underline{185} \\
 185 \\
 \underline{2035} \\
 933 \\
 \underline{6105} \\
 6105 \\
 \underline{18315} \\
 \text{Ans. } 1,898.655 \text{ cubic ft.}
 \end{array}$$

$$\begin{array}{r}
 3.14159 \\
 1.5 \\
 \underline{1570795} \\
 314159 \\
 2) 1.5 \quad 4712385 \\
 \underline{.75} \quad .75 \\
 23561925 \\
 32986695 \\
 2) 353428875 \\
 \underline{1.767144375} \text{ sq. ft. surface} \\
 7.5 \text{ [at bottom.} \\
 8835721875 \\
 \underline{12370010625} \\
 3) 13.2535828125 \\
 \underline{4.4178609375} \\
 .6702058666 \\
 \underline{3.7476550709} \\
 \text{Ans. } 3.748 \text{ sq. ft. nearly}
 \end{array}$$

$$\begin{array}{r}
 3.14159 \\
 .8 \\
 \underline{2.513272} \\
 .4 \\
 2) 1.0053088 \\
 \underline{.5026544} \text{ sq. ft. sur-} \\
 4 \text{ [face at top.} \\
 3) 2.0106176 \\
 \underline{.670205866 \&c.}
 \end{array}$$

(10)

$$\begin{array}{r}
 16 \\
 10 \\
 36 \overline{) 6.0} (.1666 \text{ \&c.} \\
 \underline{36} \text{ or } \frac{1}{6} \text{ in. contraction in rising 1 in.} \\
 240 \\
 \underline{216} \\
 240
 \end{array}$$

Dividing 16 by $\frac{1}{6}$

$$\begin{array}{r}
 6 \\
 \underline{96} \text{ in. to come to a point.} \\
 36 \\
 \underline{60} \text{ in. height of little cone.}
 \end{array}$$

$ \begin{array}{r} 3.14159 \\ 16 \\ \hline 1884954 \\ 314159 \\ \hline 50.26544 \\ 8 \\ 2) 402.12352 \\ \hline 201.06176 \text{ sq. ft. surface} \\ 96 \text{ [at bottom.} \\ \hline 120637056 \\ 180955584 \\ 3) 19301.92896 \\ \hline 643397632 \\ 1570.795 \\ 231) 4863.18132 (21.0527 \\ \hline 462 \\ 243 \\ 231 \\ \hline 1218 \\ 1155 \\ \hline 631 \\ 462 \\ \hline 1693 \\ 1617 \\ \hline 76 \end{array} $	$ \begin{array}{r} 3.14159 \\ 10 \\ \hline 31.41590 \\ 5 \\ 2) 157.0795 \\ \hline 78.53975 \text{ sq. ft. surface} \\ 60 \text{ [at top.} \\ \hline 3) 4712.38500 \\ \hline 1570.795 \end{array} $
---	--

Ans. 21.053 gals. nearly.

Lesson 175.

(1)

4

3

3) 1.0

.333 &c.or $\frac{1}{3}$ ft. contraction in rising 1 ft.Dividing 4 by $\frac{1}{3}$

3

12 ft. to come to a point.

4

9 ft. height of little cone.

3.14159

4

12.56636

2

2) 25.1327212.56636 sq. ft. surface
12 [at top.]25.13272

12.56636

3) 150.79632

50.26544

21.2057325

29.0597075 cubic ft.

1728

2324776600

581194150

2034179525

290597075

231) 50215.1745600 (217.38 wine gals. about Ans.
462401

231

1705

1617

881

693

1887

1848

39

3.14159

3

9.42477

12

9.42477

4.712385

2) 14.1371557.0685775 sq. ft. surface
9 [at bottom.]3) 63.617197521.2057325

(2)

$$\begin{array}{r}
 8 \\
 2 \\
 \hline
 18 \overline{) 6.0} (.333 \text{ \&c.} \\
 \underline{54} \quad \text{or } \frac{1}{3} \text{ ft. contraction} \\
 \quad \quad \quad \text{[in rising 1 ft.} \\
 60 \\
 \underline{54} \\
 6 \\
 \text{Dividing 8 by } \frac{1}{3} \\
 3 \\
 \hline
 24 \text{ ft. to come to a} \\
 \underline{18} \quad \quad \text{[point.}
 \end{array}$$

$$\begin{array}{r}
 8 \\
 8 \\
 \hline
 64 \\
 24 \\
 \hline
 256 \\
 128 \\
 \hline
 3 \overline{) 1536} \\
 \underline{512} \\
 8 \\
 \hline
 504 \text{ cubic ft. Ans.}
 \end{array}$$

(3)

$$\begin{array}{r}
 2 \\
 2 \\
 \hline
 4 \\
 6 \text{ sides.} \\
 \hline
 \text{Ans. 24 sq. ft.}
 \end{array}$$

6 ft., height of little pyramid.

(4)

$$\begin{array}{r}
 1.5 \\
 4 \\
 \hline
 6.0 \\
 2 \\
 \hline
 12 \text{ sq. ft. surface of} \\
 \text{top and bottom.} \\
 14\frac{2}{3} \\
 4\frac{2}{3} \\
 \hline
 \text{Ans. } 31\frac{2}{3}
 \end{array}$$

$$\begin{array}{r}
 \text{ft.} \quad \text{in.} \\
 2 \quad 2 \\
 \hline
 \text{ft.} \quad \text{ft.} \\
 \text{or } 1\frac{1}{2} \quad \text{or } \frac{1}{3} \\
 \hline
 1\frac{1}{3} \text{ ft. wide.} \\
 11 \\
 4 \text{ ft. length.} \\
 \hline
 44 \\
 4\frac{4}{3} \text{ sq. ft. surface} \\
 \text{[of 1 side.} \\
 2 \overline{) 6} \\
 \underline{3} \\
 4\frac{4}{3} \text{ sq. ft. surface} \\
 \text{[of 3 sides.} \\
 3 \overline{) 44} \\
 \underline{14\frac{2}{3}} \\
 \text{or } 14\frac{2}{3}
 \end{array}$$

$$\begin{array}{r}
 \text{ft.} \quad \text{ft.} \\
 1.5 \quad 2 \\
 \hline
 \text{ft.} \quad \text{ft.} \\
 \text{or } \frac{2}{3} \quad \text{or } 1\frac{2}{3} \\
 \hline
 \frac{2}{3} \text{ times } 1\frac{1}{3} \\
 6 \quad 11 \\
 6 \quad 8 \\
 \hline
 36 \quad 88 \\
 8\frac{8}{3} \text{ sq. ft. surface} \\
 \text{[of 1 end.} \\
 2 \overline{) 36} \\
 \underline{18} \\
 8\frac{8}{3} \text{ or } 4\frac{4}{3} \text{ sq. ft.} \\
 \text{surface} \\
 \text{of 2 ends.} \\
 9 \overline{) 44} \\
 \underline{4\frac{2}{3}}
 \end{array}$$

MENSURATION.

$$\begin{array}{r}
 (5) \\
 2\frac{1}{2} \\
 1\frac{1}{2} \\
 1 \\
 \hline
 5 \\
 12 \\
 \hline
 \text{Ans. } 60 \text{ sq. ft.}
 \end{array}$$

$$\begin{array}{r}
 (6) \\
 3.14159 \\
 \quad 3 \\
 \hline
 9.42477 \\
 \quad 20 \\
 \hline
 188.49540 \\
 \text{Ans. } 188.495 \text{ sq. ft.} \\
 \text{[about.}
 \end{array}$$

$$\begin{array}{r}
 (7) \\
 13 \\
 23 \\
 \hline
 39 \\
 26 \\
 \hline
 2)299 \\
 \hline
 149.5 \\
 \quad 4 \text{ sides.} \\
 \hline
 \text{Ans. } 598.0 \text{ sq. ft.}
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 3.14159 \\
 \quad 6 \\
 \hline
 18.84954 \\
 \quad 18 \\
 \hline
 15079632 \\
 1884954 \\
 \hline
 2)33929172 \\
 \hline
 169.64586 \\
 169.646 \text{ sq. ft.} \\
 \text{[nearly, Ans.}
 \end{array}$$

$$\begin{array}{r}
 (9) \\
 4 \\
 2 \\
 \hline
 7)2 \\
 \quad 2 \text{ ft. contraction} \\
 \quad \text{in rising 1 ft.} \\
 \hline
 \text{Dividing 4 by } \frac{2}{7} \\
 \quad 7 \\
 \hline
 2)28 \\
 \quad 14 \text{ ft. to come} \\
 \quad \text{to a point.} \\
 \quad 7 \\
 \hline
 7 \text{ ft. slant} \\
 \text{height of} \\
 \text{little cone.}
 \end{array}$$

$$\begin{array}{r}
 3.14159 \\
 \quad 4 \\
 \hline
 12.56636 \\
 \quad 14 \\
 \hline
 3.14159 \\
 \quad 2 \\
 \hline
 5026544 \\
 1256636 \\
 \hline
 2)17592904 \\
 \hline
 8796452 \\
 2199113 \\
 \hline
 2)4398226 \\
 \hline
 2199113 \\
 \hline
 65.97339 \\
 65.973 \text{ sq. ft. about, Ans.}
 \end{array}$$

$$\begin{array}{r}
 (10) \\
 3.14159 \\
 \quad 7920 \\
 \hline
 628318 \\
 2827431 \\
 2199113 \\
 2488139280 \\
 \quad 7920 \\
 \hline
 497627856 \\
 2239325352 \\
 1741697496 \\
 \hline
 2)19706063097600 \\
 \hline
 \text{Ans. } 98,530,315.488 \text{ sq. miles.}
 \end{array}$$

Lesson 176.

(1)		(2)		(3)	
ft. in.	ft. in.	ft. in.	in.	4)18	
1 3	19 4	2 3	3		
ft.	ft.	ft.	ft.	4.5	
or 1.25	or 19½	or 2.25	or ½	5	
19½		33			
1125		675		22.5	
125		675		20	
23.75		74.25		1|000)450.0	
4166 &c. — ½		3		45	
241666 &c.		222.75		20	
40		2 planks.		Ans. \$9.00	
966.6666 &c.	Ans. 445.50 ft.				
Ans. 966½ ft.					
(4)	(5)	(6)			
2.5	4)10	4)8			
30	2.5	2			
75.0	2.5	2			
4	125	4			
300	50	40			
50	6.25	4|0)16|0			
1|000)15|000	30	Ans. 4 T.			
15	Ans. 187.50 cubic ft.				
16					
90					
15	(7)				
Ans. \$240	87				
	7				
	609				
	12.5				
	3045				
	1218				
	609				
	24½				
	or 24.75)7612.50 (307.5757				
	(Carried over.)				

(Brought over.)

$$\begin{array}{r}
 24\frac{1}{2} \\
 \text{or } 24.75) 7612.50 \quad (307.5757 \\
 \underline{7425} \\
 18750 \\
 \underline{17325} \\
 14250 \\
 \underline{12375} \\
 18750
 \end{array}
 \qquad
 \begin{array}{r}
 307.5757 \\
 \underline{1.80} \\
 24606056 \\
 \underline{3075757} \\
 553.63626
 \end{array}$$

Ans. \$553.64

(8)

$$\begin{array}{r}
 48 \text{ one side} \quad 26 \\
 48 \text{ one side} \quad 2 \text{ ft. out for side walls.} \\
 24 \text{ one end} \quad \underline{24} \\
 24 \text{ one end} \quad 26 \\
 \underline{144} \quad 15 \\
 19 \quad \underline{130} \\
 \underline{1296} \quad \text{in.} \quad 26 \\
 144 \quad 8 \quad \underline{300} \text{ sq. ft. surface in both gable ends.} \\
 \underline{2736} \quad \text{ft.} \quad 2 \\
 260 \quad \text{or } \frac{1}{2} \quad 3) \underline{780} \\
 \underline{2996} \quad \underline{260} \\
 514 \text{ outs for doors and windows.} \\
 \underline{2482} \\
 27 \text{ bricks in a cubic ft.} \\
 64) 1728(27 \\
 \underline{128} \\
 448 \quad \underline{17374} \\
 448 \quad \underline{4964} \\
 448
 \end{array}$$

Ans. 67,014 bricks.

(9)

$$\begin{array}{r}
 3.14159 \\
 \underline{10} \\
 31.41590 \\
 \underline{5} \\
 2) 157.0795 \\
 \underline{78.53975}
 \end{array}$$

Ans. 78.54 sq. in. nearly.

(10)

$$\begin{array}{r}
 12 \\
 \underline{20} \\
 240 \\
 \underline{2\frac{1}{2}} \\
 480 \\
 \underline{120 - \frac{1}{2}}
 \end{array}$$

Ans. 600 cubic in.

GAUGING.

Lesson 177.

(1)	(2)	
20	33	
16	26	
—	7	
4	2	
3	3) 14	
—	4 $\frac{2}{3}$	
5) 12	. 26	3.14
—	30 $\frac{2}{3}$	30 $\frac{2}{3}$
2.4		94.20
16		1.04 $\frac{2}{3}$ — $\frac{1}{3}$
—		1.04 $\frac{2}{3}$ — $\frac{1}{3}$
3.14		
18.4	2) 30 $\frac{2}{3}$	
—	—	96.29 $\frac{1}{3}$
1256	15 $\frac{1}{3}$	15 $\frac{1}{3}$
2512		48145
314		9629
2) 18.4		
—		144435
57.776		32.09 $\frac{7}{8}$ — $\frac{1}{8}$ of 96.29 $\frac{1}{3}$
9.2		.05 $\frac{1}{8}$ — .00 $\frac{1}{8}$ of 15 $\frac{1}{3}$
—		
115552	2) 1476.49 $\frac{8}{9}$	.00 $\frac{1}{8}$
519984	—	42
—	738.24 $\frac{17}{18}$	.01
2) 531.5392	42	.42
—	147648	17
265.7696	295296	294
28	—	42
21261568	3100608	.3966 — $\frac{17}{18}$ 18) 7.14 (.3966
5315392		54 [&c.
—		174
231) 7441.5488 (32.2 gals.	2150.4) 31006.4766 (14.4 bu.	162
693	—	
—	21504 [about, Ans.	
511	95024	120
462	86016	108
—	—	120
495	90087	108
462	86016	12
—	—	
33	4071	

(3)

19

16

3

3

5) 9

1.8

16

17.8

3.14

17.8

2512

2198

314

2) 17.8

55.892

8.9

8.9

503028

447136

2) 497.4388

248.7194

25

12435970

4974388

277.274) 62179850 (22.4 gals.

554548 [about, Ans.

672505

554548

1179570

1109096

70474

(4)

22

16

6

3

5) 18

3.6

16

19.6

3.14

19.6

1884

2826

314

2) 19.6

61.544

9.8

9.8

492352

553896

2) 603.1312

301.5656

33

9046968

9046968

282) 99516648 (35.28

846

35.3 gals.

[nearly, Ans.

1491

1410

816

564

2526

2256

270

$$\begin{array}{r}
 (5) \\
 36 \\
 28 \\
 \hline 8 \\
 .2 \\
 3) 16 \\
 \hline 5\frac{1}{3} \\
 28 \\
 \hline 33\frac{1}{3} \\
 314 \\
 \hline 33\frac{1}{3} \\
 942 \\
 \hline 942 \\
 10362 \\
 1.0466 \&c. - \frac{1}{3} \\
 2) 33\frac{1}{3} \quad 1046666 \&c. \\
 \hline 16\frac{2}{3} \quad 16\frac{2}{3} \\
 6279999 \&c. \\
 1046666 \&c. \\
 \hline 16746666 \&c. \\
 348888 \&c. - \frac{1}{3} \\
 348888 \&c. - \frac{1}{3} \\
 2) 17444444 \&c. \\
 \hline 8722222 \&c. \\
 48 \\
 69777777 \&c. \\
 34888888 \&c. \\
 418666666 \&c. \\
 500 \\
 2150.4) 209333333333 (9,734.6 \text{ bu. about, Ana.} \\
 \hline 193536 \\
 157973 \\
 150528 \\
 \hline 74453 \\
 64512 \\
 \hline 99413 \\
 86016 \\
 133973 \\
 129024 \\
 \hline 4949
 \end{array}$$

Lesson 178.

$$\begin{array}{r}
 (1) \\
 17.8 \\
 16 \\
 \hline
 1.8 \\
 2 \\
 \hline
 3) 3.6 \\
 \hline
 1.2 \\
 16 \\
 \hline
 17.2 \quad 3.14 \\
 \quad 17.2 \\
 \hline
 \quad 628 \\
 \quad 2198 \\
 \quad 314 \\
 2) 17.2 \quad \hline
 \quad 54.008 \\
 \quad 8.6 \quad 8.6 \\
 \hline
 \quad 324048 \\
 \quad 432064 \\
 \hline
 2) 4644688 \\
 \hline
 \quad 2322344 \\
 \quad \quad 8 \\
 \hline
 231) 18578752 (8.04 \\
 \quad 1848 \quad 8 \text{ gals. about,} \\
 \quad \hline
 \quad 987 \quad [\text{Ans.}] \\
 \quad 924 \\
 \quad \hline
 \quad 63
 \end{array}$$

$$\begin{array}{r}
 (2) \\
 18 \\
 15 \\
 \hline
 \frac{1}{3} \text{ of } 3 \\
 3) 3 \\
 \hline
 1 \\
 2 \\
 \hline
 2 \\
 15 \\
 \hline
 17 \quad 3.14 \\
 \quad 17 \\
 \hline
 \quad 2198 \\
 \quad 314 \\
 2) 17 \quad \hline
 \quad 53.38 \\
 \quad 8.5 \quad 8.5 \\
 \hline
 \quad 26690 \\
 \quad 42704 \\
 \hline
 2) 453.730 \\
 \hline
 \quad 226865 \\
 \quad \quad 14 \\
 \hline
 \quad 907460 \\
 \quad 226865 \\
 \hline
 231) 3176.110 (13.7 \text{ gals.} \\
 \quad 231 \quad [\text{about, Ans.}] \\
 \hline
 \quad 866 \\
 \quad 693 \\
 \hline
 \quad 1731 \\
 \quad 1617 \\
 \hline
 \quad 114
 \end{array}$$

(3)

$ \begin{array}{r} 18 \\ 15 \\ \hline \frac{2}{3} \text{ of } 3 \\ 3) 3 \\ \hline 1 \\ 2 \\ \hline 2 \\ 15 \\ \hline 17 \quad 3.14 \\ \quad \quad 17 \\ \hline \quad \quad 2198 \\ \quad \quad 314 \\ 2) 17 \quad \hline \quad 53.38 \\ \quad 8.5 \quad 8.5 \\ \hline \quad \quad 26690 \\ \quad \quad 42704 \\ \hline .2) 453.730 \\ \hline \quad 226865 \\ \quad \quad 29 \\ \hline \quad 2041785 \\ \quad 453730 \\ \hline \quad \quad \text{[whole cask.} \\ \quad 6579.085 \text{ cubic in. in the} \\ \quad 1156.0433 \text{ \&c. outs.} \end{array} $	$ \begin{array}{r} 16 \\ 15 \\ \hline 1 \\ 2 \\ \hline 2 \\ 15\frac{1}{2} \quad 3.14 \\ \quad \quad 15\frac{1}{2} \\ \hline \quad \quad 1570 \\ \quad \quad 314 \\ \hline \quad \quad 47.10 \\ \quad \quad 1.0466 \text{ \&c. } \frac{1}{8} \\ \quad \quad 1.0466 \text{ \&c. } \frac{1}{8} \\ 2) 15\frac{1}{2} \quad \hline \quad 49.1933 \text{ \&c.} \\ \quad \quad 7\frac{1}{8} \quad 7\frac{1}{8} \\ \hline \quad \quad 344.3533 \\ \quad \quad 8.1988 \text{ \&c. } \frac{1}{8} \\ \quad \quad 32.7955 \text{ \&c. } \frac{1}{8} \\ \hline 2) 385.3477 \text{ \&c.} \\ \hline \quad 192.6738 \text{ \&c.} \\ \quad \quad 6 \\ \hline \quad 1156.0433 \text{ \&c.} \end{array} $
--	--

$$\begin{array}{r}
 277.274) 5423.0416 (19.55 \\
 \underline{277274} \\
 2650301 \\
 \underline{2495466} \\
 1548356 \\
 \underline{1386370} \\
 161986 \\
 \underline{138370} \\
 23616
 \end{array}$$

19.6 gals. nearly, Ans.

(4)

$$\begin{array}{r} 46 \\ 25 \\ \hline \end{array}$$

21 in. height of hollow space.

$$\begin{array}{r} 36 \\ 26 \\ \hline 10 \\ 3 \\ \hline 5) 30 \\ \hline 6 \\ 26 \\ \hline 32 \end{array}$$

3.14

32

$$\begin{array}{r} 628 \\ 942 \\ \hline 2) 32 \\ \hline 100.48 \\ 16 \quad 16 \end{array}$$

$$\begin{array}{r} 60288 \\ 10048 \\ \hline \end{array}$$

2) 1607.68

80384

46

482304

321536

3697664

156383304 outs.

$$\begin{array}{r} 34 \\ 26 \\ \hline 8 \\ 3 \\ \hline 5) 24 \\ \hline \end{array}$$

4.8

26

30.8

3.14

30.8

$$\begin{array}{r} 2512 \\ 942 \\ \hline 2) 30.8 \\ \hline 96.712 \\ 15.4 \quad 15.4 \end{array}$$

386848

483560

96712

2) 1489.3648

7446824

21

7446824

14893648

156383304

2150.4) 21338.3096 (9.9 bu. about, Ans.
193536

198470

193536

4934

TONNAGE OF VESSELS.

Lesson 179.

$$\begin{array}{r}
 \text{(1)} \\
 \begin{array}{r}
 24 \\
 3 \\
 \hline
 5 \overline{) 72} \quad 84.4 \\
 \underline{14.4} \quad 14.4 \\
 \quad 70.0 \\
 \quad 24 \\
 \quad \hline
 \quad 28 \\
 \quad 14 \\
 \quad \hline
 \quad 1680 \\
 \quad 10 \\
 \hline
 95 \overline{) 16800} \quad (176 \frac{80}{95} \text{ T. Ans.} \\
 \underline{95} \\
 \quad 730 \\
 \quad 665 \\
 \quad \hline
 \quad 650 \\
 \quad 570 \\
 \quad \hline
 \quad \frac{80}{95}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 \begin{array}{r}
 36 \\
 3 \\
 \hline
 5 \overline{) 108} \quad 150 \\
 \underline{21.6} \quad 21.6 \\
 \quad 128.4 \\
 \quad 36 \\
 \quad \hline
 \quad 770.4 \\
 \quad 3852 \\
 2 \overline{) 36} \quad 4622.4 \\
 \underline{18} \quad 18 \\
 \quad 369792 \\
 \quad 46224 \\
 \quad \hline
 \quad 83203.2 \\
 \text{(Carried up.)}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(2)} \\
 \begin{array}{r}
 27 \\
 3 \\
 \hline
 5 \overline{) 81} \quad 106.2 \\
 \underline{16.2} \quad 16.2 \\
 \quad 90.0 \\
 \quad 27 \\
 \quad \hline
 \quad 63 \\
 \quad 18 \\
 \quad \hline
 2 \overline{) 27} \quad 2430 \\
 \underline{13.5} \quad 13.5 \\
 \quad 1215 \\
 \quad 729 \\
 \quad 243 \\
 \hline
 95 \overline{) 32805.0} \quad (345 \frac{30}{95} \text{ T.} \\
 \underline{285} \quad \text{[Ans.} \\
 \quad 430 \\
 \quad 380 \\
 \quad \hline
 \quad 505 \\
 \quad 475 \\
 \quad \hline
 \quad \frac{30}{95}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(Brought up.)} \\
 95 \overline{) 83203.2} \quad (875 \frac{78}{95} \text{ T. about,} \\
 \underline{760} \quad \text{[Ans.} \\
 \quad 720 \\
 \quad 665 \\
 \quad \hline
 \quad 553 \\
 \quad 475 \\
 \quad \hline
 \quad \frac{78}{95}
 \end{array}$$

TONNAGE OF VESSELS.

(4)

$$\begin{array}{r}
 20 \\
 3 \\
 \hline
 5) 60 \\
 \hline
 12 \quad 75 \\
 12 \quad 12 \\
 \hline
 63 \\
 20 \\
 \hline
 1260 \\
 9 \\
 \hline
 95) 11340 (119 \frac{3}{5} \text{ T. Ans.} \\
 95 \\
 \hline
 184 \\
 95 \\
 \hline
 890 \\
 855 \\
 \hline
 \frac{3}{5}
 \end{array}$$

(5)

$$\begin{array}{r}
 18.5 \\
 3 \\
 \hline
 5) 55.5 \quad 60 \\
 11.1 \quad 11.1 \\
 \hline
 48.9 \\
 18.5 \\
 \hline
 2445 \\
 3912 \\
 489 \\
 90465 \\
 7.2 \\
 \hline
 180930 \\
 633255 \\
 95) 6513480 (68 \frac{3}{5} \text{ T. about,} \\
 570 \quad \text{[Ans.} \\
 \hline
 813 \\
 760 \\
 \hline
 \frac{3}{5}
 \end{array}$$

(6)

$$\begin{array}{r}
 44 \\
 3 \\
 \hline
 5) 132 \\
 26.4 \\
 \hline
 190 \\
 26.4 \\
 \hline
 163.6 \\
 44 \\
 \hline
 6544 \\
 6544 \\
 \hline
 2) 44 \quad 7198.4 \\
 22 \quad 22 \\
 \hline
 143968 \\
 143968 \\
 \hline
 95) 158364.8 (1666.9 \\
 95 \quad 1667 \text{ T. nearly, Ans.} \\
 \hline
 633 \\
 570 \\
 \hline
 636 \\
 570 \\
 \hline
 664 \\
 570 \\
 \hline
 940 \\
 855 \\
 \hline
 85
 \end{array}$$

SQUARE ROOT.

Lesson 182.

- | | | |
|---|--|---|
| <p>(1)</p> $\begin{array}{r} 256(16 \text{ Ans.} \\ 1 \\ \hline 26)156 \\ 156 \\ \hline \end{array}$ | <p>(2)</p> $\begin{array}{r} 324(18 \text{ Ans.} \\ 1 \\ \hline 28)224 \\ 224 \\ \hline \end{array}$ | <p>(3)</p> $\begin{array}{r} 97476129(9,873 \text{ Ans.} \\ 81 \\ \hline 188)1647 \\ 1504 \\ \hline 1967)14361 \\ 13769 \\ \hline 19743)59229 \\ 59229 \\ \hline \end{array}$ |
| <p>(4)</p> $\begin{array}{r} 1002001(1,001 \text{ Ans.} \\ 1 \\ \hline 2001)002001 \\ 2001 \\ \hline \end{array}$ | | |
| <p>(5)</p> $\begin{array}{r} 998001(999 \text{ Ans.} \\ 81 \\ \hline 189)1880 \\ 1701 \\ \hline 1989)17901 \\ 17901 \\ \hline \end{array}$ | <p>(6)</p> $\begin{array}{r} 2025(45 \text{ ft. Ans.} \\ 16 \\ \hline 85)425 \\ 425 \\ \hline \end{array}$ | <p>(7)</p> $\begin{array}{r} 784(28 \text{ Ans.} \\ 4 \\ \hline 48)384 \\ 384 \\ \hline \end{array}$ |
| <p>(8)</p> $\begin{array}{r} 37 \quad 32 \\ 80 \quad 20 \\ \hline 2960 \quad 640 \\ \hline 2960 \\ 640 \\ \hline 3600(60 \text{ ft. Ans.} \\ 36 \\ \hline 00 \end{array}$ | <p>(9)</p> $\begin{array}{r} 4624(68 \text{ Ans.} \\ 36 \\ \hline 128)1024 \\ 1024 \\ \hline \end{array}$ | <p>(10)</p> $\begin{array}{r} 2)1250 \\ \hline 625(25 \text{ ft. Ans.} \\ 4 \\ \hline 45)225 \\ 225 \\ \hline \end{array}$ |

Lesson 184.

(1)

$$\begin{array}{r} .0081 \text{ (.09 Ans.} \\ \underline{81} \end{array}$$

(3)

$$\begin{array}{r} 895372 \text{ (946.2409} \\ \underline{81} \quad 946.241 \text{ nearly,} \\ \text{[Ans.} \end{array}$$

$$\begin{array}{r} 184) 853 \\ \underline{736} \end{array}$$

$$\begin{array}{r} 1886) 11772 \\ \underline{11316} \end{array}$$

$$\begin{array}{r} 18922) 45600 \\ \underline{37844} \end{array}$$

$$\begin{array}{r} 189244) 775600 \\ \underline{756976} \end{array}$$

$$\begin{array}{r} 18924899) 186240000 \\ \underline{170323281} \\ 15916719 \end{array}$$

(2)

$$\begin{array}{r} 6\dot{2}8.19\dot{5}0 \text{ (25.0638 about,} \\ \underline{4} \quad \text{[Ans.} \end{array}$$

$$\begin{array}{r} 45) 228 \\ \underline{225} \end{array}$$

$$\begin{array}{r} 5006) 31950 \\ \underline{30036} \end{array}$$

$$\begin{array}{r} 50123) 191400 \\ \underline{150369} \end{array}$$

$$\begin{array}{r} 501268) 4103100 \\ \underline{4010144} \\ 92956 \end{array}$$

(4)

$$\begin{array}{r} 144(12 \\ \underline{1} \end{array}$$

$$\begin{array}{r} 22) 44 \\ \underline{44} \end{array}$$

$$\begin{array}{r} 256(16 \quad 1\frac{2}{3} \text{ or } \frac{5}{3} \text{ Ans.} \\ \underline{1} \end{array}$$

$$\begin{array}{r} 26) 156 \\ \underline{156} \end{array}$$

(5)

$$\begin{array}{r} 1\frac{3}{16} \\ 16) 3.0 \text{ (.1875} \quad .1875 \text{ (.433 about,} \\ \underline{16} \quad \text{[Ans.} \end{array}$$

$$\begin{array}{r} 140 \\ \underline{128} \end{array}$$

$$\begin{array}{r} 83) 275 \\ \underline{249} \end{array}$$

$$\begin{array}{r} 120 \\ \underline{112} \end{array}$$

$$\begin{array}{r} 863) 2600 \\ \underline{2589} \end{array}$$

$$\begin{array}{r} 80 \\ \underline{80} \end{array}$$

11

(6)

$$98\frac{1}{2}$$

$$\begin{array}{r} \text{or } 98.25 \text{ (99.12 about,} \\ \underline{81} \quad \text{[Ans.} \end{array}$$

$$\begin{array}{r} 189) 1725 \\ \underline{1701} \end{array}$$

$$\begin{array}{r} 1981) 2400 \\ \underline{1981} \end{array}$$

$$\begin{array}{r} 19822) 41900 \\ \underline{39644} \\ 2256 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 6.25 \text{ (2.5 Ans.)} \\
 \underline{4} \\
 45) 225 \\
 \underline{225} \\
 \\
 \text{(9)} \\
 61322 \\
 \underline{3} \\
 4) 183966 \\
 \underline{4599150} \text{ (214.456 ft. wide Ans.)} \\
 \underline{4} \quad \underline{4} \text{ about.} \\
 41) 59 \quad 3) 857.824 \\
 \underline{41} \\
 424) 1891 \quad 285.941 \text{ ft. long about.} \\
 \underline{.1696} \\
 4284) 19550 \\
 \underline{17136} \\
 42885) 241400 \\
 \underline{214425} \\
 428906) 2697500 \\
 \underline{2573436} \\
 124064
 \end{array}$$

$$\begin{array}{r}
 \text{(11)} \\
 20.25 \\
 \underline{20.25} \\
 10125 \\
 \underline{4050} \\
 4050 \\
 3) 4100625 \\
 \underline{1366875} \text{ (1.691 ft. breadth about. Ans.)} \\
 \underline{1} \quad \underline{3} \\
 21) 36 \quad 35.073 \text{ ft. length about.} \\
 \underline{21} \\
 226) 1568 \\
 \underline{1356} \\
 2329) 21275 \\
 \underline{20961} \\
 23381) 31400 \\
 \underline{23381} \\
 8019
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 5) 2672.05 \\
 \underline{53441} \text{ (23.117 ft. wide Ans.)} \\
 \underline{4} \quad \underline{5} \text{ about.} \\
 43) 134 \quad 115.585 \text{ ft. long about.} \\
 \underline{129} \\
 461) 541 \\
 \underline{461} \\
 4621) 8000 \\
 \underline{4621} \\
 46227) 337900 \\
 \underline{323589} \\
 14311
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 .000430 \text{ (.0219 about, Ans.)} \\
 \underline{4} \\
 41) 80 \\
 \underline{41} \\
 429) 3900 \\
 \underline{3861} \\
 39
 \end{array}$$

Lesson 185.**(1)**

$$\begin{array}{r}
 18 \quad 15 \\
 18 \quad 15 \\
 \hline
 144 \quad 75 \\
 18 \quad 15 \\
 \hline
 324 \quad 225
 \end{array}$$

$$\begin{array}{r}
 324 \\
 225 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 549 \text{ (23.4307)} \\
 4 \quad 23.431 \text{ ft. nearly, Ans.} \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 43)149 \\
 129 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 464)2000 \\
 1856 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 4683)14400 \\
 14049 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 468607)3510000 \\
 3280249 \\
 \hline
 229751
 \end{array}$$

(3)

$$\begin{array}{r}
 20 \quad 16 \\
 20 \quad 16 \\
 \hline
 400 \quad 96 \\
 \quad 16 \\
 400 \quad \hline
 256 \quad 256 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 144 \text{ (12 ft. Ans.)} \\
 1 \\
 \hline
 22)44 \\
 44 \\
 \hline
 \end{array}$$

(2)

$$\begin{array}{r}
 24 \quad 18 \\
 24 \quad 18 \\
 \hline
 96 \quad 144 \\
 48 \quad 18 \\
 \hline
 576 \quad 324
 \end{array}$$

$$\begin{array}{r}
 576 \\
 324 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 900 \text{ (30 ft. Ans.)} \\
 9 \\
 \hline
 \end{array}$$

$$6)00$$

(4)

$$\begin{array}{r}
 25 \quad 15 \\
 25 \quad 15 \\
 \hline
 125 \quad 75 \\
 50 \quad 15 \\
 \hline
 625 \quad 225
 \end{array}$$

$$\begin{array}{r}
 625 \\
 225 \\
 \hline
 400 \text{ (20 ft. Ans.)} \\
 4 \\
 \hline
 4)00
 \end{array}$$

$$\begin{array}{r}
 \text{(5)} \\
 \begin{array}{r}
 40 \quad 36 \\
 40 \quad 36 \\
 \hline
 1600 \quad 216 \\
 108 \\
 \hline
 1600 \quad 1296 \\
 1296 \\
 \hline
 2896 \text{ (53.814 rods about, Ans.)} \\
 25 \\
 103 \overline{)396} \\
 309 \\
 \hline
 1068 \overline{)8700} \\
 8544 \\
 \hline
 10761 \overline{)15600} \\
 10761 \\
 \hline
 107624 \overline{)483900} \\
 430496 \\
 \hline
 53404
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(6)} \\
 \begin{array}{r}
 6 \quad 8 \\
 6 \quad 8 \\
 \hline
 36 \quad 64 \\
 \hline
 36 \\
 64 \\
 \hline
 100 \text{ (10 ft. Ans.)} \\
 1 \\
 2 \overline{)00}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \begin{array}{r}
 2 \overline{)24} \\
 \underline{12} \quad 12 \\
 \underline{12} \quad 12 \\
 \underline{24} \quad 24 \\
 \underline{12} \quad 12 \\
 \underline{144} \quad 144 \\
 \underline{144} \\
 \underline{288} \text{ (16.97 ft. about, Ans.)} \\
 \underline{1} \\
 26 \overline{)188} \\
 \underline{156} \\
 \underline{329} \overline{)200} \\
 \underline{2961} \\
 3387 \overline{)23900} \\
 \underline{23709} \\
 \underline{191}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 \begin{array}{r}
 \text{A.} \quad \text{qr.} \quad \text{sq. rods.} \\
 2 \quad 1 \quad 32 \\
 4 \\
 \hline
 8 \\
 1 \\
 \hline
 9 \\
 40 \\
 \hline
 360 \\
 32 \\
 \hline
 392 \text{ sq. rods; the square of} \\
 2 \quad \text{[one side of the field.]} \\
 \hline
 784 \text{ (28 rods. Ans.)} \\
 4 \\
 \hline
 48 \overline{)384} \\
 \underline{384}
 \end{array}
 \end{array}$$

(9)

$$\begin{array}{r}
 16 \\
 16 \\
 \hline
 96 \\
 16 \\
 \hline
 2) 256 \\
 128 \text{ (11.3 in. square about,} \\
 1 \quad \quad \quad \text{[Ans.} \\
 \hline
 21) 28 \\
 21 \\
 \hline
 223) 700 \\
 669 \\
 \hline
 31
 \end{array}$$

(10)

$$\begin{array}{r}
 20 \quad 12 \\
 20 \quad 12 \\
 \hline
 400 \quad 24 \\
 \quad 12 \\
 \hline
 400 \quad 144 \\
 144 \quad 144 \\
 \hline
 256 \text{ (16 ft. Ans.} \\
 1
 \end{array}$$

CUBE ROOT.

Lesson 188.

(1)

$$\begin{array}{r}
 2197(13 \quad 10 \\
 1 \quad \text{[Ans.} \quad 10 \\
 \hline
 300) 1197 \quad 100 \\
 1197 \quad 3 \\
 \hline
 300 \\
 300 \\
 3 \\
 \hline
 900 \quad 30 \quad 9 \text{ square of} \\
 9 \quad 3 \quad \text{[units.} \\
 \hline
 900 \quad 270 \quad 27 \text{ cube of} \\
 270 \quad \text{[units.} \\
 27 \\
 \hline
 1197
 \end{array}$$

(2)

$$\begin{array}{r}
 15625(25 \quad 20 \\
 8 \quad \text{[Ans.} \quad 20 \\
 \hline
 1200) 7625 \quad 400 \\
 7625 \quad 3 \quad 20 \\
 \hline
 1200 \quad 3 \\
 1200 \quad 60 \quad 5 \\
 5 \quad 25 \quad 5 \\
 \hline
 6000 \quad 30 \quad 25 \\
 12 \quad 5 \\
 \hline
 6000 \quad 1500 \quad 125 \\
 1500 \\
 125 \\
 \hline
 7625
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 9261 \overline{) 2120} \\
 8 \text{ [Ans. } 20 \\
 \hline
 1200 \overline{) 1261} \quad 400 \\
 \underline{1261} \quad 3 \\
 \hline
 1200 \\
 \hline
 1200 \\
 60 \\
 \hline
 1 \\
 \hline
 1261
 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \\
 2924 \overline{) 207143} \quad 10 \\
 1 \text{ [Ans. } 10 \\
 \hline
 300 \overline{) 1924} \quad 100 \\
 \underline{1744} \quad 3 \\
 \hline
 58800 \overline{) 180207} \quad 300 \quad 16 \quad 4 \\
 \underline{180207} \quad 300 \quad 18 \quad 4 \\
 \quad 4 \quad 3 \quad 4 \\
 \hline
 1200 \quad 480 \quad 64 \\
 \underline{480} \\
 64 \\
 \hline
 1744
 \end{array}$$

$$\begin{array}{r}
 \text{(5)} \\
 729.000 \overline{) 90} \text{ Ans.} \\
 729 \\
 \hline
 000
 \end{array}$$

$$\begin{array}{r}
 140 \\
 140 \\
 \hline
 56 \\
 14 \\
 \hline
 19600 \\
 3 \\
 \hline
 58800 \quad 140 \quad 3 \\
 \quad 3 \quad 3 \\
 \hline
 58800 \quad 420 \quad 9 \\
 3 \quad 9 \quad 3 \\
 \hline
 176400 \quad 3780 \quad 27 \\
 \underline{3780} \\
 27 \\
 \hline
 180207
 \end{array}$$

$$\begin{array}{r}
 \text{(6)} \\
 164359469195433 \overline{) 54777} \text{ Ans.} \\
 125 \\
 \hline
 7500 \overline{) 39359} \quad 50 \\
 \underline{32464} \quad 50 \\
 \hline
 874800 \overline{) 6895469} \quad 2500 \quad 50 \\
 \underline{6203323} \quad 3 \quad 3 \\
 \hline
 89762700 \overline{) 692146195} \quad 7500 \quad 150 \quad 4 \\
 \underline{629143333} \quad 7500 \quad 16 \quad 4 \\
 \hline
 8999258700 \overline{) 63002862433} \quad 7500 \quad 90 \quad 16 \\
 \underline{63002862433} \quad 4 \quad 15 \quad 4 \\
 \hline
 30000 \quad 2400 \quad 64 \\
 \underline{2400} \\
 64 \\
 \hline
 32464 \\
 \text{(Carried over.)}
 \end{array}$$

(Brought over.)

$$\begin{array}{r}
 540 \\
 540 \\
 \hline
 216 \\
 270 \\
 \hline
 291600 \quad 540 \\
 \quad 3 \quad 3 \\
 \hline
 874800 \quad 1620 \quad 7 \\
 \quad \quad 49 \quad 7 \\
 \hline
 874800 \quad 1458 \quad 49 \\
 \quad 7 \quad 648 \quad 7 \\
 \hline
 6123600 \quad 79380 \quad 343 \\
 \quad 79380 \\
 \quad 343 \\
 \hline
 6203323
 \end{array}$$

$$\begin{array}{r}
 5470 \\
 5470 \\
 \hline
 3829 \\
 2188 \\
 \hline
 2735 \\
 \hline
 29920900 \quad 5470 \\
 \quad 3 \quad 3 \\
 \hline
 89762700 \quad 16410 \quad 7 \\
 \quad \quad 49 \quad 7 \\
 \hline
 89762700 \quad 14769 \quad 49 \\
 \quad 7 \quad 6564 \quad 7 \\
 \hline
 628338900 \quad 804090 \quad 343 \\
 \quad 804090 \\
 \quad 343 \\
 \hline
 629143333
 \end{array}$$

$$\begin{array}{r}
 54770 \\
 54770 \\
 \hline
 38339 \\
 38339 \\
 \hline
 21908 \\
 27385 \\
 \hline
 2999752900 \quad 54770 \\
 \quad 3 \quad 3 \\
 \hline
 8999258700 \quad 164310 \quad 7 \\
 \quad \quad 49 \quad 7 \\
 \hline
 8999258700 \quad 147879 \quad 49 \\
 \quad 7 \quad 65724 \quad 7 \\
 \hline
 62994810900 \quad 8051190 \quad 343 \\
 \quad 8051190 \\
 \quad 343 \\
 \hline
 63002862433
 \end{array}$$

$$\begin{array}{r}
 1728(12 \text{ in.} \\
 1 \quad [Ans. \\
 300) \overline{728} \\
 \quad 728 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 (7) \\
 10 \\
 10 \\
 \hline
 100 \\
 3 \\
 \hline
 300 \\
 300 \quad 30 \\
 2 \quad 4 \\
 \hline
 600 \quad 120 \\
 120 \\
 8 \\
 \hline
 728
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 \text{min.} \\
 60 \\
 60 \\
 \hline
 3600 \text{ sec.} \\
 60 \\
 \hline
 216000(60 \text{ ft. Ans.} \\
 216 \\
 \hline
 000
 \end{array}$$

(9)

13824 (24 in. square	20		
8	20		
1200)5824	400	20	
5824	3	3	
	1200	60	4
		16	4
	1200	36	16
	4	6	4
	4800	960	64
	960		
	64		
	5824		

(10)

110592 (48 ft. Ans.	40		
64	40		
4800)46592	1600	40	
46592	3	3	
	4800	120	8
		64	8
	4800	48	64
	8	72	8
	38400	7680	512
	7680		
	512		
	46592		

Lesson 190.

(1)

.000825 (.0938 nearly,	90		
729	90		
24300)96000	8100		
75357	3		
2594700)20643000	24300	90	3
		3	3
	24300	270	9
	3	9	3
	72900	2430	27
	2430		
	27		
	75357		
	930		
	930		
	279		
	837		
	864900		
	3		
	2594700		

(4)

 $\frac{512}{2197}$ $\frac{8 \text{ cube root of numerator.}}{13 \text{ cube root of denominator.}} \text{ } \} \text{ Ans.}$

2197(13	10		
1	10		
<hr/>	<hr/>		
300)1197	100		
1197	3		
	<hr/>		
	300	10	3
		3	3
	<hr/>	<hr/>	<hr/>
	300	30	9
	3	9	3
	<hr/>	<hr/>	<hr/>
	900	270	27
	270		
	27		
	<hr/>		
	1197		

(5)

$\frac{7}{20}$			
20)7			
<hr/>			
.35			
.350(.70472 or .7047 about,	70		
343	[Ans. 70		
<hr/>	<hr/>		
14700)7000	4900	700	
	3	3	
<hr/>	<hr/>	<hr/>	
1470000)7000000	14700	2100	4
5913664		16	4
<hr/>	<hr/>	<hr/>	<hr/>
148684800)1086336000	1470000		
1041828823	1470000	126	16
<hr/>	4	21	4
<hr/>	<hr/>	<hr/>	<hr/>
14898062700)44507177000	5880000	33600	64
	33600		
	64		
	<hr/>		
	5913664		

(Carried over.)

CUBE ROOT.

(Brought over.)

7040		
7040		
<hr/>		
2816		
4928		
<hr/>		
49561600	7040	
3	3	
<hr/>		
148684800	21120	7
	49	7
<hr/>		
148684800	19008	49
7	8448	7
<hr/>		
1040793600	1034880	343
1034880		
343		
<hr/>		
1041828823		

70470
70470
<hr/>
49329
28188
49329
<hr/>
4966020900
3
<hr/>
14898062700

(6)

8814			90	
or 881333 &c.	(95876		90	90
729	9588	nearly,	3	3
		[Ans.	8100	
24300)	152333		3	270
	128375		24300	25
<hr/>				
2707500)	23958333		24300	135
	21842912		5	54
<hr/>				
275329200)	2115421333		121500	6750
	1928713003		6750	125
<hr/>				
27573170700)	186708330333		125	
<hr/>			128375	

(Carried over.)

(Brought over.)

950		
950		
<hr/>		
475		
855		
<hr/>		
902500	950	
3	3	
<hr/>		
2707500	2850	8
	64	8
<hr/>		
2707500	1140	64
8	1710	8
<hr/>		
21660000	182400	512
182400		
512		
<hr/>		
21842912		
9580		
9580		
<hr/>		
7664		
4790		
8622		
<hr/>		
91776400	9580	
3	3	
<hr/>		
275329200	28740	7
	49	7
<hr/>		
275329200	25866	49
7	11496	7
<hr/>		
1927304400	1408260	343
1408260		
343		
<hr/>		
1928713003		
95870		
95870		
<hr/>		
67109		
76696		
47935		
86283		
<hr/>		
9191056900		
3		
<hr/>		
27573170700		

CUBE ROOT.

$$\begin{array}{r}
 (7) \\
 3.14159 \\
 \underline{7920} \\
 628318 \\
 2827431 \\
 \underline{2199113} \\
 2488139280 \\
 \underline{7920} \\
 497627856 \\
 2239325352 \\
 1741697496 \\
 2)7920 \\
 \underline{3960} \\
 19706063097600 \\
 \underline{3960} \\
 1182363785856 \\
 1773545678784 \\
 591181892928 \\
 3)78036009866496000 \\
 26012003288832000 (6383.5 nearly. \\
 \underline{216} \quad \text{or } 6383\frac{1}{2} \text{ miles sq.,} \\
 10800)44120 \quad \text{[nearly, Ans.]} \\
 \underline{34047} \\
 1190700)10073032 \\
 \underline{9647072} \\
 122113200)425960888 \quad 60 \\
 \underline{366511887} \quad 60 \\
 12222806700)59449001320 \quad 3600 \\
 \underline{3} \\
 10800 \quad 60 \quad 3 \\
 \underline{3} \quad 3 \quad 3 \\
 10800 \quad 180 \quad 9 \\
 \underline{3} \quad 9 \quad 3 \\
 32400 \quad 1620 \quad 27 \\
 \underline{1620} \\
 27 \\
 34047
 \end{array}$$

(Carried over.)

(Brought over.)

630		
630		
<hr/>		
189		
378		
<hr/>		
396900	630	
3	3	
<hr/>		
1190700	1890	8
	64	8
<hr/>		
1190700	756	64
8	1134	8
<hr/>		
9525600	120960	512
120960		
512		
<hr/>		
9647072		
<hr/>		
6380		
6380		
<hr/>		
5104		
1914		
3828		
<hr/>		
40704400		
3		
<hr/>		
122113200	6380	3
	3	3
<hr/>		
122113200	19140	9
3	9	3
<hr/>		
366339600	172260	27
172260		
27		
<hr/>		
366511887		
<hr/>		
63830		
63830		
<hr/>		
19149		
51064		
19149		
38298		
<hr/>		
4074268900		
3		
<hr/>		
12222806700		

(8)

$$2) 13.718$$

$$\begin{array}{r} \text{Ans.} \\ 6.859 \text{ (1.9 ft. breadth or} \\ 1 \quad 2 \quad \text{[depth.} \\ \hline 300) 5859 \text{ 3.8 ft. length.} \\ 5859 \end{array}$$

$$\begin{array}{r} 10 \\ 10 \\ \hline 100 \\ 3 \\ \hline 300 \quad 10 \quad 9 \\ \quad 3 \quad 9 \\ \hline 300 \quad 30 \quad 81 \\ 9 \quad 81 \quad 9 \\ \hline 2700 \quad 2430 \quad 729 \\ 2430 \\ 729 \\ \hline 5859 \end{array}$$

(9)

$$\begin{array}{r} 81 \\ 9 \\ \hline 8) 729 \end{array}$$

$$\begin{array}{r} 91.125 \text{ (4.5 in. or } 4\frac{1}{2} \text{ in. sq.} \quad 40 \\ 64 \quad 8 \quad \text{[at the base.} \quad 40 \\ \hline 4800) 27125 \quad 9) 36.0 \quad 1600 \quad 40 \\ 27125 \quad 3 \quad 3 \\ \hline \quad 4 \text{ in. high.} \quad 4800 \quad 120 \quad 5 \\ \quad \quad 25 \quad 5 \end{array}$$

(10)

$$\begin{array}{r} .00064 \text{ (.04 Ans.} \\ 64 \end{array}$$

(11)

$$\begin{array}{r} 4 \\ 6 \\ \hline 24 \\ 21\frac{1}{2} \end{array}$$

$$\hline 24$$

$$48$$

$$8 - \frac{1}{2}$$

$$\begin{array}{r} 512 \text{ (8 ft. square, Ans.} \\ 512 \end{array}$$

$$\begin{array}{r} 4800 \quad 60 \quad 25 \\ 5 \quad 24 \quad 5 \\ \hline 24000 \quad 3000 \quad 125 \\ 3000 \\ 125 \\ \hline 27125 \end{array}$$

SPECIFIC GRAVITY.

Lesson 191.

(1)

3 times $\frac{1}{10}$ are $\frac{3}{10}$, circum. $\frac{1}{2}$ of $\frac{1}{10}$ is $\frac{1}{20}$, rad. $\frac{1}{20}$ of $\frac{3}{10}$ is $\frac{3}{200}$ $\frac{1}{2}$ of $\frac{3}{200}$ is $\frac{3}{400}$, surface of end.12 times $\frac{3}{400}$ are $\frac{36}{400}$, cubic ft.

[in 1 bar.

16 bars. 16)400(25 $\frac{36}{25}$ cubic ft. in
32 [16 bars.

80

80

8890 oz. in 1 cubic ft.

36

5334

2667 16

25)320040(12801.6(800 lbs.

25

128

70

01

50

1.6 oz.

200

200

40

25

150

150

(2)

15

.75

75

105

105

1.125

11350 oz. in 1 cubic ft.

5625

3375

1125

1125

16)12768.750(798 lbs.

112

156

144

128

128

.75 oz.

or $\frac{3}{4}$ oz.

(3)

8

6

4)2.0

.5 in. contraction in falling 1 in.

.5)8.0

16 in. to come to a point.

4

12 in. height of small pyra-
[mid.

8

6

8

6

64

36

16

12

384

72

64

36

3)1024

3)432

341

144

144

197

1728

197

1728

197

1728

197

1728

197

1728

197

1728

197

1728

197

1728

197

1728

197 cubic in. in dish.

197

1728

197

1728

197

1728

197

1728

197

1728

197

1728

(Carried over.)

(Brought over.)

$$\begin{array}{r}
 13560 \text{ oz. in 1 cubic ft.} \\
 197\frac{1}{2} \\
 \hline
 9492 \\
 12204 \\
 1356 \\
 \hline
 2671320 \\
 \frac{1}{2} \cdot \cdot \cdot 4520 \quad 16 \\
 \hline
 1728)2675840(1548.5(96 \text{ lbs.} \\
 1728 \quad 144 \\
 \hline
 9478 \quad 108 \\
 8640 \quad 96 \\
 \hline
 8384 \quad 12.5 \\
 6912 \quad \text{or } 12\frac{1}{2} \text{ oz.} \\
 \hline
 14720 \\
 13824 \\
 \hline
 8960 \\
 8640 \\
 \hline
 320
 \end{array}$$

(4)

$$73|00)584|00(8(2 \text{ ft. square, Ans.}$$

$$\begin{array}{r} 584 \\ 8 \end{array}$$

(5)

$$\begin{array}{r}
 3.14159 \\
 4 \\
 \hline
 12.56636 \\
 2 \\
 2)25.13272 \\
 \hline
 12.56636 \text{ surface of base.} \\
 7 \\
 3)87.96452 \\
 \hline
 29.3215 \\
 2700 \text{ oz. in 1 cubic ft.} \\
 \hline
 2052505 \\
 586430 \\
 \hline
 16)79168.0500(4948 \text{ lbs.} \\
 64 \quad \quad \quad \text{[about, Ans.]} \\
 \hline
 151 \\
 144 \\
 \hline
 76 \\
 64 \\
 \hline
 128 \\
 128
 \end{array}$$

(6)

$$\begin{array}{r}
 8 \\
 4 \\
 \hline
 32 \\
 2 \\
 \hline
 64 \\
 1000 \\
 \hline
 64000 \quad 44000 \text{ cubic ft. in 1,000 bricks.} \\
 1728 \\
 \hline
 \text{oz. in 1 cubic ft. } 2000 \quad 16 \\
 \hline
 1728)128000000(74074(4,629 \text{ lbs.} \\
 12096 \quad 64 \\
 \hline
 7040 \quad 100 \\
 6912 \quad 96 \\
 \hline
 12800 \quad 47 \\
 12096 \quad 32 \\
 \hline
 7040 \quad 154 \\
 6912 \quad 144 \\
 \hline
 128 \quad 10 \text{ oz}
 \end{array}$$

(7)

45 fath.
6

$\frac{5}{8}$ diam. 5
 $\frac{5}{8}$ rad. 5

25
54
27

$2\frac{1}{2}$ divided by 2 3240 in.
or $1\frac{1}{2}$ sq. in., sur- 25
[face of end.]

1620
648

cubic in.
12) 81000 (6750 4750 cubic ft.
72
90
84
60
60
0

6750
1100 oz. in 1 cubic ft.
675
675 16
1728) 7425000 (4296.87 (268 lbs.
6912 32
5130 109
3456 96
16740 136
15552 128

(8)

3.1 4 1 5 9 circum. and surf.
.5 rad.

11880 8.87 oz.
10368 [or 9 oz. nearly.]

5) 1.5 7 0 7 9 5
52359833 &c.
930 oz. in 1 cubic ft.

12960
12096
864

157079499
471238497

16) 480.9 4 6 4 4 6 9 0 (30 lbs.
48
6.9 oz. about.

(9)

$$\begin{array}{r}
 21 \\
 18 \\
 \hline
 3 \\
 2 \\
 \hline
 3) 6 \\
 \hline
 2 \\
 18 \\
 \hline
 20
 \end{array}$$

$$\begin{array}{r}
 3.14 \\
 20 \\
 \hline
 2) 20 \\
 \hline
 10 \\
 \hline
 6280 \\
 10 \\
 \hline
 \end{array}$$

$$2) 628.00$$

$$\begin{array}{r}
 314 \\
 36 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1884 \\
 942 \\
 \hline
 \end{array}$$

11304 cubic in. or $\frac{11304}{1728}$ cubic ft.
 1030 oz. in 1 cubic ft.

$$\begin{array}{r}
 33912 \\
 11304 \\
 \hline
 1728) 11643120 (6737 (421 \text{ lbs. about. Ans.} \\
 10368 \\
 \hline
 12751 \quad 16 \\
 12096 \quad 64 \\
 \hline
 6552 \quad 33 \\
 5184 \quad 32 \\
 \hline
 13680 \quad 17 \\
 12096 \quad 16 \\
 \hline
 1584 \quad 1
 \end{array}$$

(10)

$$\begin{array}{r}
 3.14159 \\
 \underline{5} \\
 2) 5 \quad 15.70795 \\
 \underline{2.5} \quad 2.5
 \end{array}$$

$$\begin{array}{r}
 7853975 \\
 3141590 \\
 \hline
 2) 39.269875 \\
 \hline
 19.6349375 \\
 19.6349375 \\
 \hline
 1256636 \\
 \hline
 7.0685775 \text{ square in. in end of pipe.} \\
 1200
 \end{array}$$

$$\begin{array}{r}
 12 \\
 100 \\
 \hline
 1200 \text{ in.} \\
 \text{[length.]}
 \end{array}$$

$$\begin{array}{r}
 141371550 \\
 70685775 \\
 \hline
 84822930000 \text{ cubic in. or } \frac{8482293}{1728} \text{ cubic ft.} \\
 7210 \text{ oz. in 1 cubic ft.}
 \end{array}$$

$$\begin{array}{r}
 8482293 \\
 16964586 \\
 59376051 \\
 \hline
 16
 \end{array}$$

$$\begin{array}{r}
 1728) 61157332530 (3539.19 (2211.9 \text{ lbs.} \\
 5184 \quad 32 \quad \text{or } 2,212 \text{ lbs. nearly. Ans.}
 \end{array}$$

$$\begin{array}{r}
 9317 \\
 8640 \\
 \hline
 6773 \\
 5184 \\
 \hline
 15893 \\
 15552 \\
 \hline
 3412 \\
 1728 \\
 \hline
 16845 \\
 15552 \\
 \hline
 1323
 \end{array}$$

$$\begin{array}{r}
 33 \\
 32 \\
 \hline
 19 \\
 16 \\
 \hline
 31 \\
 16 \\
 \hline
 159 \\
 144 \\
 \hline
 11
 \end{array}$$

Lesson 192.

(1)

oz.	oz.	dr.	
36	33	7 $\frac{2}{10}$	16) 7.2 (.45
6	6		64
<hr/>	<hr/>		<hr/>
30	27		80
			80

oz.
3|0) 2|7.45

.915 Ans.

(2)

oz.	oz.	dr.	
20	33	7	16) 7.0 (.4375
4	4		64
<hr/>	<hr/>		<hr/>
16	29		60
			48
			<hr/>
	oz.		
16) 29.4375	(1.8398		120
16	1.840 near-		112
	[ly, Ans.		<hr/>
			80
			80

(3)

1 length.	63
.5 breadth.	48
<hr/>	<hr/>
.5	157
.25 thickness.	144
<hr/>	<hr/>
25	135
10	128
<hr/>	<hr/>
2) .125	7

.0625 cubic ft.
1000

62.5000 oz. weight of .0625 cubic ft. of water.

62.5) 35.00 (.560 Ans.
3125

3750
3750

(4)

98) 1728 (17.6326 times 98	17.6326	17.6326
.98 [in. in a cubic ft.	30 grs.	2 grs.
<hr/> 748	<hr/> 528.9780	<hr/> 35.2652
686	Air 529 grs. [nearly.	Hydrogen gas 35.27 grs. [nearly.
<hr/> 620		
588		
<hr/> 320	16) 1000 (62.5 lbs. in 1,000 oz.	
294	96 7000 grs. in a lb.	
<hr/> 260	<hr/> 40	437500.0 grs. in 1,000 oz. or cubic
196	32	[ft. of water.
<hr/> 640	<hr/> 80	
588	80	
<hr/> 52		

437500) 528.978 (.001209	437500) 35.26520 (.00008 about.
437500 .00121 nearly.	3500000
<hr/> 914780	<hr/> 26520
875000	
<hr/> 3978000	
3937500	
<hr/> 40500	

(5)	(6)
17800	1000
8790	920
<hr/> 19260	<hr/> 920
17800	840
<hr/> Ans. 9,010 of gold, to 1,460 of [copper.	<hr/> 80 of alcohol, to 80 of water, or ½ a gal. of each, Ans.

(7)	(8)
.840	920
10	800
<hr/> 1.000	<hr/> 1000
6	920
<hr/> 8.400	<hr/> 30 of water to 80 of rum.
6.000	The water must then be ¾ or ¾ of the rum.
<hr/> 8.400	¾ of 4 is ¾ or 1½ gal., Ans.
6.000	
<hr/> 16) 14400 (.900 Ans.	
144	
<hr/> 00	

Lesson 193.**(1)**

216	18.000	19.360
204	10.510	18.000
<hr/>		
12)216(18 specific	7.490 of gold, and	1.360 of silver.
12 [gravity.		
<hr/>	7.490	
96	1.360	
96	<hr/>	
	8.850	

It contains $\frac{1.36}{8.85}$ times 216 grs. of silver.

1.36
216

816
136
272

216
33

8.85) 293.76 (33 grs. of silver about, and 183 grs. of [gold about.

2826
2655

171

(2)

956.25
300

656.25
437.5

1093.75) 437.500 (.400 Ans.
437500**(3)**

180
16

108
18

1000) 2880
Ans. 2.880

THE LEVER.

Lesson 196.

$$\begin{array}{r}
 (1) \\
 \frac{1}{10} \text{ of } 2000 \\
 10 \overline{)2000} \\
 \hline
 \text{Ans. } 200 \text{ lbs.}
 \end{array}$$

$$\begin{array}{r}
 (2) \\
 \frac{50}{720} \text{ of } 12 \text{ ft.} \\
 12 \overline{)50} \\
 \hline
 600 \\
 12 \overline{)600} \\
 \hline
 12 \\
 6 \overline{)12} \\
 \hline
 2 \\
 720 \overline{)7200} (10 \text{ in. from the} \\
 \hline
 720 \quad \text{[fulcrum, Ans.]} \\
 \hline
 0
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 15 \\
 \underline{15} \\
 135 \\
 135 \text{ times } 90 \\
 \underline{15} \\
 90 \\
 \hline
 135 \overline{)13500} (100 \text{ lbs.} \\
 \hline
 135 \quad \text{[Ans.]} \\
 \hline
 00
 \end{array}$$

(4)
 The short part of the lever must be $\frac{150}{1500}$ or $\frac{1}{10}$ [of the long part.
 Both parts then are $\frac{1}{10}$ and $\frac{1}{10}$, or $\frac{1}{10}$ of the long [part.
 11)11 (1 ft. from the end, being $\frac{1}{10}$ of the [long part, Ans.

$$\begin{array}{r}
 (5) \\
 \frac{3}{14} \text{ of } 933\frac{1}{2} \\
 933\frac{1}{2} \\
 \underline{3} \\
 2799 \\
 1 - \frac{1}{2} \\
 \hline
 14 \overline{)2800} (200 \text{ lbs.} \\
 \hline
 28 \quad \text{[Ans.]} \\
 \hline
 00
 \end{array}$$

$$\begin{array}{r}
 (6) \\
 \frac{145}{10} \text{ of } 10 \text{ ft.} \\
 145 \\
 \underline{10} \\
 900 \overline{)1450} (1 \text{ ft.} \\
 \hline
 900 \\
 \hline
 550 \\
 12 \overline{)550} \\
 \hline
 110 \\
 55 \overline{)110} \\
 \hline
 6600 (7\frac{1}{2} \text{ in.} \\
 \hline
 6300 \\
 \hline
 333 \text{ or } \frac{2}{3} \text{ or } \frac{1}{2}
 \end{array}$$

$$\begin{array}{r}
 (7) \\
 12 \\
 \underline{3} \\
 36 \text{ in.} \\
 \frac{36}{2} \text{ of } 4 \\
 \text{or } 18 \text{ times } 4 \\
 18 \\
 \underline{4} \\
 \hline
 \text{Ans. } 72 \text{ lbs.}
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 \frac{56}{4} \text{ of } 1\frac{1}{2} \text{ inches.} \\
 \text{or } 14 \text{ times } 1\frac{1}{2} \\
 14 \\
 \underline{1\frac{1}{2}} \\
 14 \\
 \underline{7 - \frac{1}{2}} \\
 \hline
 12 \overline{)21} (1 \text{ ft.} \\
 \hline
 12 \\
 \hline
 9 \text{ in.}
 \end{array}$$

THE WHEEL AND AXLE.

Lesson 197.

$$\frac{5}{8} \text{ of } 350$$

$$\begin{array}{r} 350 \\ .5 \\ \hline \end{array}$$

$$6) 175.0$$

$$29 \frac{1}{2} \text{ lbs. } 6) 16$$

$$\text{Ans. } 29 \text{ lbs. } 2 \frac{2}{3} \text{ oz. } 2 \frac{1}{3} \text{ or } 2 \frac{2}{3} \text{ oz.}$$

$$(2)$$

$$12$$

$$7 \text{ ft.}$$

$$84$$

$$\frac{24}{5} \text{ of } 12$$

$$84$$

$$12$$

$$168$$

$$84$$

$$9) 1008$$

$$\text{Ans. } 112 \text{ lbs.}$$

$$(3)$$

$$\frac{500}{40} \text{ of } 1$$

$$4) 500$$

$$125$$

$$\text{or } 12 \frac{1}{2} \text{ ft. Ans.}$$

$$(4)$$

$$\frac{30}{270} \text{ of } 9$$

$$\text{or } \frac{3}{27} \text{ or } \frac{1}{9} \text{ of } 9$$

$$\text{or } 1 \text{ ft. Ans.}$$

$$(5)$$

The first wheel is 10 times the first axle, and the second wheel is 10 times the second axle.

$$10$$

$$10$$

$$100$$

$$25$$

$$\text{Ans. } 2,500 \text{ lbs.}$$

$$(6)$$

$$12$$

$$9 \text{ ft.}$$

$$108$$

$$10 \frac{2}{3} \text{ times } 38$$

$$38$$

$$108$$

$$304$$

$$38$$

$$108) 4104.0 \text{ (380 lbs., weight the power will balance.)}$$

$$324$$

$$864$$

$$864$$

$$0$$

THE PULLEY.

Lesson 198.

(1)

$$\begin{array}{r} 80 \\ 4 \\ \hline 320 \text{ lbs.} \\ \text{[Ans.]} \end{array}$$

(2)

By drawing a figure we see that the weight is here supported by 7 ropes.

$$\begin{array}{r} 7) 420 \\ \hline \end{array}$$

Ans. 60 lbs.

(3)

$$\begin{array}{r} 8) 5000 \\ \hline 625 \text{ lbs. supported} \\ \text{[by each rope.]} \\ \frac{2}{3} \text{ times } 625 \\ \text{or } .1 \text{ of } 625 \\ \text{or } 62\frac{1}{2} \text{ lbs. Ans.} \end{array}$$

(4)

$$\begin{array}{r} 6) 360 \\ \hline 60 \text{ lbs. power will balance} \\ 360 \text{ lbs., and is} \\ 2) 60 \quad \frac{2}{3} \text{ of the power} \\ \hline 30 \text{ is } \frac{1}{3} \quad \frac{1}{3} \text{ is lost.} \\ 30 \\ 60 \\ \hline 90 \text{ lbs. Ans.} \end{array}$$

(5)

By drawing a figure we see that the weight is here supported by 5 ropes.

$$\begin{array}{r} 50 \\ 5 \\ \hline 3) 250 \\ \hline 83\frac{1}{3} \text{ lbs., } \frac{1}{3} \text{ of } 250 \text{ lbs.} \\ 250 \\ 83\frac{1}{3} \\ \hline \text{Ans. } 166\frac{2}{3} \text{ lbs.} \end{array}$$

(6)

$$\begin{array}{r} 3) 30 \\ \hline 10 \text{ lbs. } \frac{1}{3} \text{ of } 30 \\ 30 \\ 10 \\ \hline 2) 0) 20 \mid 0 \\ \hline \end{array}$$

10 ropes to support the weight, and by drawing a figure we see there must be 5 movable pulleys. Ans.

THE INCLINED PLANE.

Lesson 199.

(1)	(2)	(3)	(4)
$\frac{2}{3}$ of 12	$\frac{3}{25}$ or $\frac{1}{5}$ of 600	$\frac{192}{575}$ of 39	$\frac{1}{18}$ of 6000
12	5)600	39	12
8		100	6000
—	Ans. 120 lbs.	—	9)0)7200|0
3)96		975)3900(4 ft.	800 lbs. will
—		3900 [Ans.	balance
Ans. 32 lbs.			[the weight with-
			out any pulleys.
			8)800
			Ans. 100 lbs.

THE SCREW.

Lesson 200.

(1)	(2)
12	36
4 ft.	2
—	—
48	3.14159
2	72 in. diam. 72
—	—
96 in. diam. 96	628318
1884954	2199113
2827431	—
—	5)4
30159264 circum.	226.19448
40	.8
—	1500
12063.70560	.8
Ans. 12,063.7 lbs.,	226.19448)1200.00000(
[about.]	113097240
	—
	69027600
	67858344
	—
	116925600 or 4.8
	113097240 os. nearly.
	—
	3828360

(3)

$$\begin{array}{r} 12 \\ 6 \\ \hline 72 \\ 2 \\ \hline 144 \text{ in. diam.} \end{array}$$

$$\begin{array}{r} 3.14159 \\ 144 \\ \hline 1256636 \\ 1256636 \\ \hline 314159 \end{array}$$

$\frac{2}{7540}$ of 45238896 in.

$$\begin{array}{r} 45238896 \\ 25 \\ \hline 226194480 \\ 90477792 \\ \hline \end{array}$$

$$\begin{array}{r} 7540)130972400 \text{ (1.5 in. nearly,} \\ 7540 \\ \hline 37697 \\ 37700 \end{array}$$

or $1\frac{1}{2}$ in. nearly,
[Ans.]

(4)

$\frac{5000}{40}$ of .16 is circum.
described by the
40)5000 lever.

$$\begin{array}{r} 125 \\ .16 \\ \hline 750 \\ 125 \end{array}$$

3.14159)2000000(6.36 diam.

$$\begin{array}{r} 1884954 \\ \hline 1150460 \\ 942477 \\ \hline \end{array}$$

3.18 ft. a-
bout, Ans.

$$\begin{array}{r} 2079830 \\ 1884954 \\ \hline 194876 \end{array}$$

(5)

$$\begin{array}{r} 12 \\ 5 \text{ ft.} \\ \hline 60 \\ 2 \\ \hline 120 \text{ in. diam.} \end{array}$$

$$\begin{array}{r} 3.14159 \\ 120 \\ \hline 628318 \\ 314159 \\ \hline 37699080 \end{array}$$

or .75 times 376.9908 is the power necessary to
[balance the weight.]

$$\begin{array}{r} 1508 \\ .75 \\ \hline 7540 \\ 10556 \end{array}$$

376.9908)11310000(3 lbs. will balance the
weight, and is $\frac{3}{4}$ of
the power expend-
ed to move it.

$$\begin{array}{r} 11310000 \\ 11309724 \\ \hline 276 \end{array}$$

$$\begin{array}{r} 2)3 \\ 1\frac{1}{2} \\ 3 \end{array}$$

Ans. $4\frac{1}{2}$ lbs.

(6)

$$\begin{array}{r}
 12 \\
 \underline{4 \text{ ft.}} \\
 48 \\
 \underline{2} \\
 96 \text{ in. diam.}
 \end{array}
 \begin{array}{r}
 3.14159 \\
 96 \\
 \hline
 1884954 \\
 2827431 \\
 \hline
 30159264 \\
 30159264 \\
 \hline
 150796320 \\
 90477792 \\
 \hline
 10555.74240 \\
 3 \\
 \hline
 4) 31667.2272 \\
 \hline
 3) 7916.8068 \text{ lbs.} \\
 \hline
 2638.9356 - \frac{1}{3} \\
 \text{(Carried up.)}
 \end{array}
 \begin{array}{r}
 \text{times } 35 \\
 \frac{1}{3} \\
 35 \\
 \hline
 150796320 \\
 90477792 \\
 \hline
 10555.74240 \\
 3 \\
 \hline
 4) 31667.2272 \\
 \hline
 3) 7916.8068 \text{ lbs.} \\
 \hline
 2638.9356 - \frac{1}{3} \\
 \text{(Carried up.)}
 \end{array}
 \begin{array}{r}
 \text{(Brought up.)} \\
 7916.8068 \\
 2638.9356 \\
 \hline
 5277.8712
 \end{array}$$

Dividing by $\frac{1}{3}$ 10555.74240
3

(Brought up.)

4) 31667.2272

7916.8068
2638.9356

Will balance

3) 7916.8068 lbs.

5277.8712

2638.9356 — $\frac{1}{3}$

Ans. 5,277.9 lbs. nearly.

(Carried up.)

THE WEDGE.

Lesson 201.

$$\begin{array}{r}
 (1) \\
 10 \\
 \underline{2} \\
 20 \\
 \frac{20}{2} \text{ or } 10 \text{ times } 50 \\
 50 \\
 \underline{10} \\
 \text{Ans. } 500 \text{ lbs.}
 \end{array}
 \begin{array}{r}
 (2) \\
 12 \\
 \underline{2} \\
 24 \\
 \frac{24}{24} \text{ or } \frac{1}{3} \text{ of } 1800 \\
 8) 1800 \\
 \hline
 \text{Ans. } 225 \text{ lbs.}
 \end{array}
 \begin{array}{r}
 (3) \\
 15 \\
 \underline{2} \\
 30 \\
 \frac{30}{15} \text{ or } \frac{2}{15} \text{ or } \frac{1}{15} \text{ of } 30 \\
 15) 30(2 \text{ in.} \\
 30 \text{ [Ans.}
 \end{array}$$

PROMISCUOUS QUESTIONS

IN

MENSURATION, SQUARE ROOT, CUBE ROOT, &c.

Lesson 203.

(1)

$$\begin{array}{r} 5 \\ 2 \\ \hline 4) 3.0 \end{array}$$

.75 ft. contraction in rising 1 ft.

$$\begin{array}{r} .75) 5.00 \text{ (6\frac{3}{4} ft. to come} \\ 450 \text{ [to a point.} \end{array}$$

$\frac{50}{100}$ or $\frac{1}{2}$

$$\begin{array}{r} 6\frac{3}{4} \\ 4 \end{array}$$

$2\frac{3}{4}$ ft. height of small
[pyramid.

$$\begin{array}{r} 5 \\ 5 \\ \hline 25 \\ 6\frac{3}{4} \\ \hline 150 \end{array}$$

$$\begin{array}{r} 8.33 \text{ \&c. } \frac{1}{3} \\ 8.33 \text{ \&c. } \frac{1}{3} \end{array}$$

$$\begin{array}{r} 3) 166.66 \text{ \&c.} \\ 55.55 \text{ \&c.} \\ 35.5 \text{ \&c.} \end{array}$$

$$\begin{array}{r} 52 \\ 2700 \text{ oz. in a cubic ft.} \end{array}$$

$$\begin{array}{r} 364 \end{array}$$

$$\begin{array}{r} 104 \end{array}$$

$$16) 140400 \text{ (8,775 lbs. Ans.}$$

$$\begin{array}{r} 128 \end{array}$$

$$\begin{array}{r} 124 \end{array}$$

$$\begin{array}{r} 112 \end{array}$$

$$\begin{array}{r} 120 \end{array}$$

$$\begin{array}{r} 112 \end{array}$$

$$\begin{array}{r} 80 \end{array}$$

$$\begin{array}{r} 80 \end{array}$$

(2)

$$74068 \text{ (42 Ans.}$$

$$\begin{array}{r} 64 \end{array}$$

$$\begin{array}{r} 4800) 10088 \\ 10088 \end{array}$$

$$\begin{array}{r} 40 \end{array}$$

$$\begin{array}{r} 40 \end{array}$$

$$\begin{array}{r} 1600 \end{array}$$

$$\begin{array}{r} 3 \end{array}$$

$$\begin{array}{r} 4800 \end{array}$$

$$\begin{array}{r} 4800 \end{array}$$

$$\begin{array}{r} 2 \end{array}$$

$$\begin{array}{r} 9600 \end{array}$$

$$\begin{array}{r} 480 \end{array}$$

$$\begin{array}{r} 8 \end{array}$$

$$\begin{array}{r} 10088 \end{array}$$

$$\begin{array}{r} 40 \end{array}$$

$$\begin{array}{r} 3 \end{array}$$

$$\begin{array}{r} 120 \end{array}$$

$$\begin{array}{r} 4 \end{array}$$

$$\begin{array}{r} 480 \end{array}$$

$$\begin{array}{r} 8 \end{array}$$

$$\begin{array}{r} 2 \end{array}$$

$$\begin{array}{r} 2 \end{array}$$

$$\begin{array}{r} 4 \end{array}$$

$$\begin{array}{r} 2 \end{array}$$

$$\begin{array}{r} 8 \end{array}$$

<p>(3)</p> $ \begin{array}{r} 33 \\ 33 \\ 24 \\ 24 \quad 30 \\ \hline 114 \quad 19 \\ 19 \quad 11 \\ \hline 1026 \quad 24 \\ 114 \quad 44 \\ \hline 2166 \quad 22 \\ 264 \quad 264 \text{ both gable} \\ 9)2430 \quad \text{[ends.]} \\ \$.25 \text{ or } \frac{1}{4} \quad 4)270 \\ \text{Ans. } \$ 67\frac{1}{2} \end{array} $	<p>(4)</p> $ \begin{array}{r} 35 \\ 20 \\ 2)55 \\ \hline 27.5 \\ 18 \\ 16 \\ 24 \\ 10 \\ 5)95.5 \\ \hline 19.1 \\ 250 \\ \hline 955 \\ 382 \\ \hline 4775.0 \end{array} $	<p>(5)</p> $ \begin{array}{r} 28 \\ 22 \\ 2)50 \\ \hline 25 \\ 23 \\ 19 \\ 18 \\ 4)85 \\ \hline 21\frac{1}{4} \text{ cubic [ft.]} \end{array} $
--	--	---

Ans. 4,775 sq. ft.

<p>(6)</p> <p>2500 square of one side.</p> $ \begin{array}{r} 2 \\ \hline 5000 \quad (\quad 70.71 \text{ ft.} \\ 49 \quad 12 \\ \hline 1407)10000 \quad 142 \\ 9849 \quad 71 \\ \hline 14141)15100 \quad 8.52 \\ 14141 \quad \text{or } 8\frac{1}{2} \text{ in. about.} \\ \hline 959 \end{array} $	<p>(7)</p> <p>ft. in.</p> $ \begin{array}{r} 22 \quad 9 \\ \hline \text{ft.} \\ \text{or } 22.75 \\ 2 \quad 12 \\ \hline 45.50 \quad 2 \\ 24 \quad 24 \\ \hline 1820 \\ 910 \\ \hline 10920 \\ \text{Ans. } 1,092 \text{ ft.} \end{array} $
---	--

<p>(8)</p> $ \begin{array}{r} 3.14159 \\ 15 \\ \hline 1570795 \\ 314159 \\ 2)15 \\ \hline 47.12385 \\ 7.5 \quad 7.5 \\ \hline 23561925 \\ 32986695 \\ \hline 2)353428875 \\ \hline 1767144375 \end{array} $	<p>(9)</p> $ \begin{array}{r} 3.14159 \\ 4 \\ \hline 1256636 \\ 2 \\ 2)25.13272 \\ \hline 1256636 \\ 27 \\ \hline 8796452 \\ 2513272 \\ \hline 33929172 \end{array} $	<p>(10)</p> $ \begin{array}{r} 3.14159 \\ 6 \\ \hline 1884954 \\ 6 \\ \hline 11309724 \\ \text{Ans. } 113\frac{1}{2} \text{ sq. in. [nearly.]} \end{array} $
--	--	---

Ans. 176.714 sq. ft. about. Ans. 339.29 cubic ft. about.

Lesson 204.

(1)

$$\begin{array}{r} 11350 \overline{) 90800} \quad (8 \text{ (2 ft. square.} \\ 90800 \quad 8 \end{array}$$

(2)

$$\begin{array}{r} 22 \\ 17 \\ \hline 5 \\ 3 \\ \hline 5 \overline{) 15} \\ 3 \\ \hline 17 \\ 20 \\ \hline 314 \quad 20 \\ \hline 6280 \\ 10 \\ \hline 2) 6280 \\ 314 \\ 26 \\ \hline 1884 \\ 628 \\ \hline 282 \overline{) 8164} \quad (29 \text{ gals. nearly, Ans.} \\ 564 \\ \hline 2524 \\ 2538 \end{array}$$

(3)

$$\begin{array}{r} 60 \\ 20 \\ \hline 1200 \\ 9\frac{1}{2} \\ \hline 10800 \\ 600 - \frac{1}{2} \\ \hline 95 \overline{) 11400} \quad (120 \text{ tons, Ans.} \\ 95 \\ \hline 190 \\ 190 \\ \hline 0 \end{array}$$

(4)

The short part is $\frac{1}{3}$ or $\frac{1}{3}$ of the long part.
Both parts then are $\frac{2}{3}$ and $\frac{1}{3}$, or $\frac{2}{3}$ of the long part.

$$\begin{array}{r} 6 \overline{) 10} \quad (1 \text{ ft.} \\ 6 \\ \hline 4 \\ 12 \\ \hline 48 \overline{) 48} \quad (8 \text{ in.} \\ 48 \end{array}$$

(5)

$\frac{250}{2000}$, or $\frac{1}{8}$ of 15000 lbs. will *balance* it, and is $\frac{3}{8}$ of the
[power expended since $\frac{1}{8}$ is lost.

$$\begin{array}{r} 8)15000 \\ 2)1875 \\ \hline 937\frac{1}{2} - \frac{1}{8} \end{array}$$

A power capable of raising 2,812 $\frac{1}{2}$ lbs. Ans.

(6)

 $\frac{3}{8}$ of 1or 1 $\frac{1}{2}$ in. Ans.

(7)

in. ft.
9 7 $\frac{1}{2}$
or .75 ft. or 7.5 ft.

 $7\frac{1}{2}$ times 100
$$\begin{array}{r} 7.5 \\ 100 \end{array}$$

.75)750.00(1000 lbs. Ans.

75

000

(8)

By drawing a figure we see that the
weight is here supported by 4 ropes.

$$\begin{array}{r} 96 \\ 4 \\ \hline 4)384 \end{array}$$

96

384

96

Ans. 288 lbs.

(9)

$$\begin{array}{r} 12 \\ 6 \\ \hline 72 \\ 2 \\ \hline 144 \text{ diam.} \end{array} \quad \begin{array}{r} 3.14159 \\ 144 \end{array}$$

1256636

1256636

314159

45238896

$$\begin{array}{r} 1 \\ 2)679 \end{array} \text{ times } 679$$

45238896)339500000(.75 lb. or $\frac{3}{4}$ of a lb. about,
316672272 [Ans.

228277280

226194480

2082800

(10)

Dividing $\frac{3}{4}$ by 2 we get $\frac{3}{8}$

$\frac{3}{8}$ and $\frac{3}{8}$ are $\frac{3}{8}$ or 1 $\frac{1}{2}$ lb.
[about, Ans.

PROGRESSION BY DIFFERENCE.

Lesson 205.

$$\begin{array}{r}
 (3) \\
 40 \\
 1 \\
 \hline
 39 \\
 6 \\
 \hline
 266 \\
 234 \quad 234 \\
 \hline
 \text{Ans. } 32
 \end{array}$$

$$\begin{array}{r}
 (4) \\
 501 \\
 1 \\
 \hline
 500 \\
 50 \\
 \hline
 25000 \\
 50 \\
 \hline
 \text{Ans. } 25,050
 \end{array}$$

$$\begin{array}{r}
 (5) \\
 34 \\
 1 \\
 \hline
 3)33 \\
 \hline
 11 \\
 12 \\
 \hline
 \text{Ans. } 23 \text{ cts.}
 \end{array}$$

Lesson 206.

$$\begin{array}{r}
 (2) \\
 100 \\
 8 \\
 4)92 \\
 23 \\
 1 \\
 \hline
 \text{Ans. } 24
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 336 \\
 16 \\
 32)320(10 \\
 32 \quad 1 \\
 \hline
 0 \quad 11 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 (4) \\
 \text{cts.} \\
 6\frac{1}{2} \\
 \text{or } \$.0625 \quad 13.00 \\
 .50 \\
 .0625)125000(200 \\
 1250 \quad \text{[Ans.]} \\
 \hline
 00
 \end{array}$$

$$\begin{array}{r}
 (6) \\
 24 \quad 122 \\
 1 \quad 7 \\
 \hline
 23 \quad 23)115(5 \text{ Ans.} \\
 115
 \end{array}$$

$$\begin{array}{r}
 (7) \\
 29 \quad 2000 \\
 1 \quad 180 \\
 28 \quad 28)1820(65 \\
 168 \quad \text{[Ans.]} \\
 \hline
 140 \\
 140
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 5 \quad 239 \\
 1 \quad 135 \\
 \hline
 4 \quad 4)104 \\
 \hline
 26 \text{ lbs.} \\
 \text{[Ans.]}
 \end{array}$$

Lesson 207.

$$\begin{array}{r}
 (2) \\
 5 \\
 595 \\
 \hline
 2)600 \\
 \hline
 300 \\
 60 \\
 \hline
 18,000 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 16 \\
 464 \\
 \hline
 2)480 \\
 \hline
 240 \\
 14 \\
 \hline
 96 \\
 24 \\
 \hline
 3,360 \text{ ft. Ans.}
 \end{array}$$

(4)

$$\begin{array}{r}
 7 \quad 43 \\
 3 \quad 3 \\
 \hline
 \text{Common diff. } 4 \quad 4) \overline{40} \\
 \quad 10 \\
 \quad 1 \\
 \hline
 11 \text{ rows.}
 \end{array}$$

$$\begin{array}{r}
 3 \text{ first term.} \\
 43 \text{ last term.} \\
 2) \overline{46} \\
 \quad 23 \\
 \quad 11 \\
 \quad 23 \\
 \quad 23 \\
 \hline
 253 \text{ Ans.}
 \end{array}$$

(5)

$$\begin{array}{r}
 5 \\
 35 \\
 2) \overline{40} \\
 \quad 20 \quad 220 \\
 \hline
 \text{Ans. } 11
 \end{array}$$

$$\begin{array}{r}
 (6) \\
 9) \overline{1296}
 \end{array}$$

$$\begin{array}{r}
 144 \text{ average of first} \\
 \text{and last terms.} \\
 2
 \end{array}$$

$$\begin{array}{r}
 288 \text{ sum of first and} \\
 \text{last terms.} \\
 272
 \end{array}$$

Ans. 16 ft.

(7)

$$\begin{array}{r}
 25 \\
 9 \quad 1 \\
 7 \quad \text{---} \\
 \text{---} \quad 24 \\
 \text{Common} \quad 2 \quad 2 \\
 \text{diff.} \quad \text{---} \\
 48 \\
 7
 \end{array}$$

55 men in last rank.

$$\begin{array}{r}
 55 \\
 7
 \end{array}$$

$$2) \overline{62}$$

$$\begin{array}{r}
 31 \\
 25 \\
 \hline
 155 \\
 62
 \end{array}$$

Ans. 775

(8)

$$\begin{array}{r}
 8 \quad 36 \\
 4 \quad 4 \quad 4 \\
 \hline
 \text{Common} \quad 4 \quad 4) \overline{32} \quad 36 \\
 \text{diff.} \quad \quad 8 \quad 40 \\
 \quad 1 \quad 20 \\
 \quad 9 \text{ ranks.} \quad 9
 \end{array}$$

Ans. 180

(9)

$$\begin{array}{r}
 30 \\
 1 \\
 \hline
 29 \\
 3 \\
 \hline
 99 \\
 87 \quad 87
 \end{array}$$

12 first [term.

$$\begin{array}{r}
 12 \\
 99
 \end{array}$$

$$2) \overline{111}$$

$$\begin{array}{r}
 55.5 \\
 30
 \end{array}$$

$$\begin{array}{r}
 1665.0
 \end{array}$$

Ans. 1,665

PROGRESSION BY QUOTIENT.

Lesson 208.

(3)	(5)
4	1828
4	1600
—	12)228 (19; there are then 20 terms.
16	12
4	108
—	108
64	2
4	2
—	4
256	2
4	8
—	2
1024	16
4 first term.	2
—	32
Ans. 4,096	2
	64
	2
	128
	2
	256
	2
	512
	2
	1024
	2
	2048
	2
	4096
	2
	8192
	2
	16384
	2
	32768
	2
	65536
	2
	131072
	2
	262144
	2
	Ans. \$524,288

Lesson 209.

$$\begin{array}{r}
 (3) \\
 1825 \\
 1325 \\
 25 \overline{) 500} \text{ (20; there are then 21} \\
 \underline{50} \quad \text{[terms.} \\
 0
 \end{array}$$

$$\begin{array}{r}
 2 \\
 2 \\
 \underline{4} \\
 2 \\
 \underline{8} \\
 2 \\
 16 \\
 2 \\
 \underline{32} \\
 2 \\
 \underline{64} \\
 2 \\
 128 \\
 2 \\
 \underline{256} \\
 2 \\
 \underline{512} \\
 2 \\
 1024 \\
 2 \\
 \underline{2048} \\
 2 \\
 4096 \\
 2 \\
 \underline{8192} \\
 2 \\
 16384 \\
 2 \\
 32768 \\
 2 \\
 65536 \\
 2 \\
 131072 \\
 2 \\
 262144 \\
 \text{(Carried up.)}
 \end{array}$$

(Brought up.)

262144

2

524288

2

1048576

2 first term.

2097152 last term.

2

2097150

2097152

4,194,302 Ans.

$$\begin{array}{r}
 (4) \\
 10 \\
 10 \\
 \underline{100} \\
 10 \\
 \underline{1000} \\
 10 \\
 \underline{10000} \\
 10 \\
 \underline{100000} \\
 10 \\
 \underline{1000000} \\
 10 \\
 \underline{10000000} \\
 10 \\
 \underline{100000000} \\
 10 \\
 \underline{1000000000} \\
 10 \\
 \underline{10000000000} \\
 10 \\
 \underline{100000000000} \\
 10 \\
 \underline{1000000000000} \text{ last term.} \\
 10 \\
 1 \\
 \underline{9} \quad 9) 99999999999 \\
 \underline{11111111111} \\
 100000000000 \\
 \text{Ans. \$ } 111,111,111.11
 \end{array}$$

(5)

 $\frac{2}{3}$, or $\frac{2}{3}$, ratio.Difference between
1, or $\frac{2}{3}$, and $\frac{2}{3}$ is $\frac{1}{3}$ 45 $\frac{1}{3}$
441 $\frac{1}{3}$
283 $\frac{1}{3}$
45 $\frac{1}{3}$ Ans. 128 $\frac{1}{3}$

Lesson 210.

(1)
 $\frac{1}{2}$, ratio.
 Difference between 2
 1 and $\frac{1}{2}$ is $\frac{3}{2}$ 2
 —
 Ans. 4

(2)
 $\frac{1}{3}$, ratio.
 Difference between 1
 1 and $\frac{1}{3}$ is $\frac{2}{3}$ 3
 —
 2)3
 —
 Ans. $1\frac{1}{2}$

(3)
 $\frac{1}{10}$, ratio.
 Difference between
 1 and $\frac{1}{10}$ is $\frac{9}{10}$
 $\frac{9}{10}$ is in $\frac{1}{10}$, $\frac{9}{10}$ or $\frac{9}{10}$
 [Ans.]

(4)
 .3).03
 $\frac{1}{10}$ or $\frac{1}{10}$ ratio.
 Difference between
 1 and $\frac{1}{10}$ is $\frac{9}{10}$
 $\frac{9}{10}$ is in .3, $\frac{3}{10}$ or $\frac{3}{10}$
 [Ans.]

(5)
 .139).000139 (.001 or $\frac{1}{1000}$, ratio.
 139

Difference between
 1 and $\frac{1}{1000}$ is $\frac{999}{1000}$

(6)
 10 terms. 10
 10
 —
 100
 10
 —
 1000
 10
 —
 10000
 10
 —
 100000
 10
 —
 1000000
 10
 —
 10000000
 10
 —
 100000000
 10
 —
 1000000000
 10
 —
 10000000000
 5

.139
 Dividing by $\frac{999}{1000}$, 1000
 —
 139.000
 —
 Ans. $\frac{139}{999}$

(7)
 $\frac{3}{8}$ or $\frac{1}{2}$, ratio.
 Difference between 384
 1 and $\frac{1}{2}$ is $\frac{1}{2}$ 3
 —
 381
 2
 —
 762
 3
 —
 Ans. 765

8)000)5000000000
 2)625000
 8)312500
 4)390625 — 2.5 or $2\frac{1}{2}$ pks.
 9,765 bu.

PROGRESSION BY QUOTIENT

APPLIED TO

COMPOUND INTEREST.

Lesson 211.

$$\begin{array}{r}
 (1) \\
 2.012196 \\
 \underline{80} \\
 160.975680 \\
 \text{Ans. \$160.98}
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 1.790848 \\
 \underline{1000} \\
 1790.848000 \\
 \underline{1000} \\
 790.848 \\
 \text{Ans. \$790.85}
 \end{array}$$

$$\begin{array}{r}
 (4) \\
 1.551328 \\
 \underline{100} \\
 155.132800 \\
 \text{Ans. \$155.13}
 \end{array}$$

$$\begin{array}{r}
 (2) \\
 6525.125 \\
 \underline{1718186} \\
 39150750 \\
 52201000 \\
 6525125 \\
 52201000 \\
 6525125 \\
 45675875 \\
 6525125 \\
 \hline
 11211378423250 \\
 \text{Ans. \$11,211.38}
 \end{array}$$

$$\begin{array}{r}
 (5) \\
 5|0) 8|4.47 \\
 \hline
 1.6894 \\
 \text{Ans. 9 years, as found} \\
 \text{by the Table.}
 \end{array}$$

$$\begin{array}{r}
 (6) \quad \$ \\
 1.790848) 3581.700000 (2000 \text{ Ans.} \\
 \underline{3581696} \\
 4000
 \end{array}$$

$$\begin{array}{r}
 (7) \quad \$ \\
 1.593848) 1434.50000 (900.0 \text{ Ans.} \\
 \underline{14344652} \\
 348000
 \end{array}$$

(8)

1.500730) 500.000000 (333.17 Ans.
4502190

4978100
4502190

4759100
4502190

(9)

1.10
1.10

2569100
1500730

11
11

10683700
10505110

1.21
1.10

178590

121
121

1331
1.10

1331
1331

14641
1.10

14641
14641

1.61051) 1000.00000 (620.92
966306

1000
620.92

Ans. \$379.08

336940
322102

1483800
1449459

343410
322102

21308

ANNUITIES.

Lesson 212.

(2)	(3)
240	425
.06	.07
<hr/>	<hr/>
14.40	29.75
29 yrs.	9 yrs.
<hr/>	<hr/>
1296	267.75
288	425
<hr/>	<hr/>
417.6	\$692.75 amount of 1st
240	[instalment.
<hr/>	<hr/>
\$657.6 amount of 1st	692.75
[instalment.	425
657.6	<hr/>
240.	2) 1117.75
<hr/>	<hr/>
2) 897.6	558.875
<hr/>	10 yrs.
448.8	<hr/>
30 yrs.	5588.750
<hr/>	<hr/>
13464.0	Ans. \$5,588.75
<hr/>	
Ans. \$13,464	

(4)	
20	
.06	
<hr/>	
12) 1.20 (.10	85 mo. .10
12	<hr/>
<hr/>	3.50
0	20
	<hr/>
	2350 amount of 1st
	[instalment.
	2350
	20
	<hr/>
2) 4350	
<hr/>	
21.75	
(Carried up.)	

(Brought up.)
21.75
36 mo.
<hr/>
13050
6525
<hr/>
783.00
<hr/>
Ans. \$783

(6)

1.24) 800.00 (645.161

744

560

496

640

620

200

124

760

744

160

124

36

1.12) 800.00 (714.285

784

160

112

480

448

320

224

960

896

640

560

80

1.18) 800.00 (677.966

708

920

826

940

826

1140

1062

780

708

720

708

12

1.06) 800.00 (754.717

742

580

530

500

424

760

742

180

106

740

742

645.161

677.966

714.285

754.717

2792.129

Ans. \$2,792.13

(7)

1.50) 300.00 (133.333 &c.

150
 500
 450
500

1.40) 200.00 (142.857

140
 600
 560
400
 280
1200
 1120
800
 700
1000
 980
20

1.30) 200.00 (153.846

130
 700
 650
500
 390
1100
 1040
600
 520
800
 780
20

1.20) 200.00 (166.666 &c.

120
 800
 720
800

1.10) 200.00 (181.818 &c.

110
 900
 880
200
 110
900

133.333
 142.857
 153.846
 166.666
 181.818
778.520

Ans. \$778.52

Lesson 213.

	(2)	(3)
	1.593848	4).07
	250	.0175
	<hr/>	1.0175 ratio. 1.0175
	7969240	1.0175
	3187696	<hr/>
1.06	398.462000	50875
1	250	71225
	<hr/>	10175
.06 .06)	148.462	10175
	<hr/>	<hr/>
	2474.3666 &c.	1.03530625
	250	1.0175
	<hr/>	<hr/>
	2724.3666 &c.	517653125
Ans. \$	2,724.37	724714375
		103530625
		103530625
		<hr/>
		1.053424109375
		1.0175
		<hr/>
		52671205
		73739687
		10534241
		10534241
		<hr/>
		1.07185902175
		1.0175
		<hr/>
		5359295
		7503013
		1071859
		1071859
		<hr/>
		1.0906165325
		1.0175
		<hr/>
		54530826625
		76343157275
		10906165325
		10906165325
		<hr/>
		1.10970232181875
		(Carried over.)

(Brought over.)

1.10970232181875
1.0175

5548510
7767914
1109702
1109702

1.1291217850 — 1st.
100

1129121785000

1129121785
100

(4)
1.215506
333

3646518
3646518
3646518
404.763498
333

.05) 71.763498

1435.26996
333

1768.26996

Ans. \$1768.27

.0175) 129121785 (737.838
1225 112912

662 678
525 525 \$850.750 Ans.

1371
1225

1467
1400

678
525

1535
1400

135

(6)

1.06) 240.00 (226.4151
212

280
212

680
636

440
424

160
106

540
530

100
106

1.689479) 240.000000 (142.0556
1689479

7105210
6757916

3472940
3378958

9398200
8447395

.06) 843595

1405991
226415

1632406
\$1,632.41 Ans.

9508050
8447395

10606550
10136874

(7)

The present worth of the last instalment
is nothing. .07

$$\begin{array}{r}
 1.07 \overline{) 180.00} \quad (168.2243 \\
 \underline{107} \\
 730 \\
 \underline{642} \\
 880 \\
 \underline{856} \\
 240 \\
 \underline{214} \\
 260 \\
 \underline{214} \\
 460 \\
 \underline{428} \\
 320 \\
 \underline{321} \\

 \end{array}$$

(8)	
1.500730) 500.000000 (333.1712	2.104852) 500.000000 (237.5464
4502190	4209704
4978100	7902960
4502190	6314556
4759100	15884040
4502190	14733964
2569100	11500760
1500730	10524260
10683700	9765000
10505110	8419408
1785900	13455920
1500730	12629112
2851700	8268080
3001460	8419408
333.1712	
237.5464	
.07) 95.6248	
1366.0685	
933.1712	
1699.2397	
Ans. \$1,699.24	

(9)

1.06)1.000(.943396 1.191016)1.0000000(.839619
 954 9528128

460
424

4718720
3573048

360
318

11456720
10719144

420
318

7375760
7146096

1020
954

2296640
1191016

660
636

11056240
10719144

24

337096

.943396
.839619

.06).103777

1.729616
.943396

2673012)3000.000000(1122329
 2673012 \$1,12233 Ans.

3269880
2673012

5968680
5346024

6226560
5346024

8805360
8019036

7863240
5346024

25172160
24057108

1115052

PROMISCUOUS QUESTIONS

IN

PROGRESSION BY DIFFERENCE, &c.

Lesson 214.

<p>(1) $\begin{array}{r} 1310796 \\ 200 \\ \hline 262159200 \\ 200 \\ \hline .07)621592 \\ \hline 8879885 \\ 2621592 \\ \hline 11501477 \\ \\$1,150.15 \text{ Ans.} \end{array}$</p>	<p>(2) $\begin{array}{r} 12 \\ 16 \\ \hline 72 \\ 12 \\ \hline 192 \text{ oz.} \\ 4 \\ \hline 2)188 \\ \hline 94 \\ 1 \\ \hline \end{array}$</p>	<p>(3) $\begin{array}{r} 14 \\ 4 \\ \hline 5)10 \\ \hline \end{array}$ <p>Ans. 2 miles.</p> <p>(4) $\begin{array}{r} 4 \\ 14 \\ \hline 2)18 \\ \hline 9 \\ 6 \\ \hline \end{array}$</p> </p>
	<p>Ans. ; in the 95th</p>	<p>Ans. 54 miles.</p>
<p>(5) .05 $\begin{array}{r} 1.05)300.00 \\ 210 \\ \hline 900 \\ 840 \\ \hline 600 \\ 525 \\ \hline 750 \\ 735 \\ \hline 150 \\ 105 \\ \hline 450 \\ 420 \\ \hline 300 \\ 210 \\ \hline 900 \\ 840 \\ \hline 60 \end{array}$</p>	<p>(6) $\begin{array}{r} 4 \\ 4 \\ \hline 16 \\ 4 \\ \hline 64 \\ 4 \\ \hline 256 \\ 4 \\ \hline 1024 \\ 4 \\ \hline 4096 \\ 4 \\ \hline 16384 \\ 4 \\ \hline 65536 \\ 3 \\ \hline 196608 \\ 3 \\ \hline 3)196605 \\ \hline 65535 \\ 196605 \\ \hline \end{array}$</p>	<p>(7) $\begin{array}{r} 12 \\ 1 \\ \hline 11 \\ 3 \\ \hline 33 \\ 7 \\ \hline \end{array}$ <p>Ans. 40</p> <p>last term. 3 first term.</p> <p>Ans. 262,140</p> </p>

$$1.06) 500.00 (471.698 \quad (8)$$

$$\begin{array}{r} 424 \\ \hline 760 \\ 742 \\ \hline 180 \\ 106 \\ \hline 740 \\ 636 \\ \hline 1040 \\ 954 \\ \hline 860 \\ 848 \\ \hline 12 \end{array}$$

Ans. \$918.13

$$1.12) 500.00 (446.428$$

$$\begin{array}{r} 448 \\ \hline 520 \\ 448 \\ \hline 720 \\ 672 \\ \hline 480 \\ 448 \\ \hline 320 \\ 224 \\ \hline 960 \\ 896 \\ \hline 64 \end{array}$$

$$\begin{array}{r} (9) \\ 1.1236 \\ 700 \\ \hline 7865200 \\ 700 \\ \hline .06) 86.52 \\ \hline 1442 \\ 78652 \end{array}$$

Ans. \$2,228.52

$$\begin{array}{r} (10) \\ 3 \\ 3 \\ \hline 9 \\ 3 \\ \hline 27 \\ 3 \\ \hline 81 \\ 3 \\ \hline 243 \\ 3 \\ \hline 729 \\ 3000 \\ \hline 64 \quad 64) 2187000 (34171.875 \\ 192 \\ \hline 267 \\ 256 \\ \hline 110 \\ 64 \\ \hline 460 \\ 448 \\ \hline 120 \\ 64 \\ \hline 560 \\ 512 \\ \hline 480 \\ 448 \\ \hline 320 \\ 320 \end{array}$$

\$34,171.87½
[Ans.]

EXCHANGE.

Lesson 218.

[illegible]

(4)	(5)	(6)
$\begin{array}{r} 817.15 \\ 9 \\ \hline 410)735.435 \\ \hline \pounds 183.85 \text{ s } 75 \\ 20 \\ \hline 17.17500 \text{ s.} \\ 12 \\ \hline 350 \\ 175 \\ \hline 2100 \\ \text{or } 2\frac{1}{4} \text{ d.} \end{array}$	$\begin{array}{r} \pounds \quad \text{s.} \quad \text{d.} \\ 101 \quad 4 \quad 6 \\ 98 \quad 15 \quad 6 \\ 250 \quad 8 \quad 3 \\ 49 \quad 11 \quad 9 \\ \hline 500 \quad 0 \quad 0 \\ 40 \\ \hline 9)20000 \\ \hline 2222.222 \text{ \&c.} \\ \hline \text{Ans. } \pounds 2,222.22 \end{array}$	$\begin{array}{r} \pounds \quad \text{s.} \quad \text{d.} \\ 78 \quad 11 \quad 8 \\ 12)8.0 \\ \hline 210)11.666 \text{ \&c.} \\ \hline 78.5833 \text{ \&c.} \\ 4 \\ \hline 314.3333 \text{ \&c.} \\ \hline \pounds 314.33\frac{1}{3} \end{array}$

$ \begin{array}{r} (7) \\ 1100 \\ 10 \\ \hline 3) 11000 \\ \hline 3666.666 \text{ \&c.} \end{array} $	$ \begin{array}{r} (8) \\ 637.50 \\ 3 \\ \hline 10) 1912.5 \\ \hline £191.25 \\ 20 \\ \hline 5.00 \text{ s.} \end{array} $
---	---

Ans. \$ 3,666.67

Lesson 219.

$$\begin{array}{r}
 \text{(1)} \\
 \begin{array}{r}
 \text{£} \quad \text{s.} \\
 750 \quad 18 \\
 2) 0 \quad 18.0 \\
 \hline
 750.9 \\
 30 \\
 \hline
 7) 22527.0 \\
 \hline
 3218.142 \\
 \text{Ans. } \$3218.14
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(2)} \\
 \begin{array}{r}
 667.37 \\
 7 \\
 \hline
 3) 0 \quad 467 \quad 1.59 \\
 \hline
 \text{£ } 155.71966 \text{ \&c.} \\
 20 \\
 \hline
 14.39333 \text{ s.} \\
 12 \\
 \hline
 78666 \\
 39333 \\
 \hline
 4.71996 \text{ d.} \\
 4 \\
 \hline
 2.87984 \text{ qrs.}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 \begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 156 \quad 8 \quad 9 \\
 12) 9.0 \\
 \hline
 2) 0 \quad 8.751 \\
 \hline
 1564375 \\
 10 \\
 \hline
 4) 15643750 \\
 \hline
 39109375 \\
 \text{Ans. } \$391.09
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \quad \$ \\
 2.5) 800.0 \quad (320 \text{ Ans.} \\
 75 \\
 \hline
 50 \\
 50 \\
 \hline
 0
 \end{array}$$

$$\begin{array}{r}
 \text{(5)} \\
 \begin{array}{r}
 9000 \\
 8 \\
 \hline
 3) 72000 \\
 \hline
 \text{Ans. } \$24,000
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{or} \\
 \begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 156 \quad 8 \quad 9 \\
 2 \frac{1}{2} \\
 \hline
 312 \\
 78 \quad - \frac{1}{2} \\
 \hline
 8 \text{ s. is } - 1 \\
 9 \text{ d. is } - .09 \\
 \hline
 \text{Ans. } \$391.09
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(6)} \\
 \begin{array}{r}
 1700 \\
 3 \\
 \hline
 8) 5100 \\
 \hline
 \text{£ } 637.5 \\
 20 \\
 \hline
 10.0 \text{ s.}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \begin{array}{r}
 200 \\
 10 \\
 \hline
 3) 2000 \\
 \hline
 \$666 \frac{2}{3} \\
 9 \\
 \hline
 5994 \\
 3 - \frac{1}{3} \\
 3 - \frac{1}{3} \\
 \hline
 4) 6000 \\
 \hline
 \text{Ans. } \text{£ } 150
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 500 \\
 9 \\
 \hline
 4 \overline{) 4500} \\
 \underline{11125} \\
 20 \\
 \hline
 100 \text{ s.}
 \end{array}
 \quad
 \begin{array}{r}
 \text{£} \quad \text{s.} \quad \text{d.} \\
 112 \quad 10 \\
 100 \quad 5 \quad 4 \\
 \hline
 12 \quad 4 \quad 8 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 \text{£} \quad \text{s.} \quad \text{d.} \\
 15 \quad 5 \quad 4 \\
 5 \\
 \hline
 76 \quad 6 \quad 8 \\
 12 \overline{) 8.0} \\
 2 \overline{) 0} \quad 6666 \text{ &c.} \\
 763333 \text{ &c.} \\
 40 \\
 \hline
 9 \overline{) 30533333} \\
 3302592 \\
 \text{Ans. } \$339.26
 \end{array}$$

Lesson 220.

$$\begin{array}{r}
 \text{(1)} \\
 \text{cts.} \\
 25 \\
 \text{or } \$\frac{1}{4} \quad 4 \overline{) 12000} \\
 \hline
 1.07 \overline{) 3000.00} \quad (2803.738 \\
 214 \quad \$2,803.74 \\
 \hline
 860 \\
 856 \\
 \hline
 400 \\
 321 \\
 \hline
 790 \\
 749 \\
 \hline
 410 \\
 321 \\
 \hline
 890 \\
 856 \\
 \hline
 34
 \end{array}$$

$$\begin{array}{r}
 \text{(2)} \\
 432 \\
 .05 \\
 \hline
 .2160 \\
 432 \\
 \hline
 4.536 \overline{) 6897.750} \quad (1520.668 \\
 4536 \quad 1,520.668 \\
 \hline
 23617 \\
 22680 \\
 \hline
 9375 \\
 9072 \\
 \hline
 30300 \\
 27216 \\
 \hline
 30840 \\
 27216 \\
 \hline
 36240 \\
 36288
 \end{array}$$

Lesson 219.

(1)		(2)	(3)
£	s.	667.37	£ s. d.
750	18	7	156 8 9
2) 0 1 | 8.0		3) 0 467 | 1.59	12) 9.0
750.9		£ 155.71966 &c.	2) 0 | 8.75 1
30		20	156.4375
7) 22527.0		1439333 s.	10
3218.142		12	4) 1564.3750
Ans. \$3218.14		78666	391.09375
		39333	Ans. \$391.09
		4.71996 d.	or
		4	£ s. d.
		2.87984 qrs.	156 8 9
			2 ½
(4)	\$	(5)	312
2.5) 800.0 (320 Ans.		9000	78 — ½
75		8	8 s. is - 1
50		3) 72000	9 d. is - .09
50		Ans. \$24,000	Ans. \$391.09
0			
(6)		(7)	
1700		200	
3		10	
8) 5100		3) 2000	
£637.5		\$666 ⅔	
20		9	
10.0 s.		5994	
		3 — ⅓	
		3 — ⅓	
		4) 0 6000	
		Ans. £150	

(8)

$$\begin{array}{r} 500 \\ 9 \\ \hline 4 \overline{) 4500} \\ \underline{1125} \\ 20 \\ \hline 10.0 \text{ s.} \end{array}$$

(9)

£	s.	d.
15	5	4
		5
<hr/>		
76	6	8
<hr/>		
	12	8.0
<hr/>		
20	6.666	&c.
<hr/>		
	763333	&c.
<hr/>		
		40
<hr/>		
	30533333	
<hr/>		
	330.2592	
<hr/>		
Ans.	\$339.26	

Lesson 220.

(1)

cts. 25
or \$ $\frac{1}{4}$

$$\begin{array}{r} 4 \overline{) 12000} \\ \hline 1.07 \overline{) 3000.00} \quad (2803.738) \\ \underline{214} \quad \$2,803.74 \\ \hline 860 \\ \underline{856} \\ 400 \\ \underline{321} \\ 790 \\ \underline{749} \\ 410 \\ \underline{321} \\ 890 \\ \underline{856} \\ 34 \end{array}$$

(2)

$$\begin{array}{r} 4.32 \\ .05 \\ \hline .2160 \\ 4.32 \\ \hline 4.536 \overline{) 6897.750} \quad (1520.668) \\ \underline{4536} \quad 1,520.668 \\ \hline 23617 \\ \underline{22680} \\ 9375 \\ 9072 \\ \hline 30300 \\ \underline{27216} \\ 30840 \\ \underline{27216} \\ 36240 \\ \underline{36288} \end{array}$$

(3)

8)30000

16)3750(234 and 6 dol-
32 [ars, Ans.

55

48

70

64

6 dollars.

(5)

485

.01

.0485

485

4.8985)10000.0000(2041.44
97970 2,041.44

[Ans.

203000

195940

70600

48985

216150

195940

202100

195940

6160

(8)

1.48

800

1184.00

Ans. \$1,184

(4)

.186

7000

1.02)1302.000(1276.47

102

Ans. \$1,276.47

282

204

780

714

660

612

480

408

720

714

(6)

cts.

33 $\frac{1}{3}$ or $\$ \frac{1}{3}$

3)15000

Ans. 5,000

(7)

24000

.40

4)9600.00

2400

4.03

72

96

9672.00

Ans. \$9,672.00

(9)
scudi. tari.
85 9

12) 90 (.75 85.75
84 .95

60 42875
60 77175

814625

Ans. \$ 81.46

(10)
3600
.11 $\frac{1}{2}$

36
36

396.00
4.00 — $\frac{1}{2}$

400.00

Ans. 400

Lesson 221.

(1)

432
.04

.1728
432

4.4928

2300
.46

138
92

4.4928) 10580000 (235 half joes.
89856

159440
134784

246560
224640

\$ 2.1920

(2)

16
.04

.64
16

43264
.16

259584
43264

16.64 16.64) 6922.24 (416 Ans.
6656

2662
1664

9984
9984

(3)

£ s. d.
645 6 8

6 $\frac{3}{12}$ s.
or 6 $\frac{3}{4}$ s.
20) 6 $\frac{3}{4}$

20 or $\frac{1}{2}$

£
645 $\frac{1}{2}$
3

1935
1 — $\frac{1}{2}$

Ans. 1,936

EXCHANGE.

(4)		(5)	
320		£	s. d.
600		964	8 4
1920.00			8 $\frac{4}{12}$ s.
925.37 $\frac{1}{2}$			or 8 $\frac{1}{3}$ s.
Ans. \$994.62 $\frac{1}{2}$		20) 8 $\frac{1}{3}$	
		$\frac{2}{3}$	60) 2 $\frac{5}{6}$
		964.4166 &c.	.4166 &c.
		2 $\frac{1}{3}$	

1928.8333 &c.
107.1574 — $\frac{1}{3}$
107.1574 — $\frac{1}{3}$
2143.1481
Ans. \$2,143.15

(6)		(7)	
1000		fl.	kreuz.
.01		108	36 or $\frac{2}{3}$ or $\frac{1}{10}$ or $\frac{1}{2}$ fl.
1000		.48	
4284		864	.48
1000		432	3
4280.000	7) 40	5184	5) 1.44
5.714	5.714	.288	.288
4285.714		52.128	
\$4,285.71 Ans.		Ans. \$52.13	

(8)		(9)	
8736.45		marks banco.	skillings.
.64		1988	15
3494580		1988.9375	16) 150 (.9375)
5241870		.34	144
55913280		79557500	60
Ans. \$5,591.33		59668125	48
		676238750	120
		Ans. \$676.24	112
			80
			80

Lesson 222.

(1)			(2)		
dollars.	reals.	mar.			
1967	7	15		10400	
				.186	
	reals.				
8)	7.44	34)	15.0 (.44	624	
			136	832	
	1967.93			104	
	.68				
				1934.400	
	1574344			1876.37	
	1180758				
				1876.37	58.0300 (.03 or 3 per
	1338.1924			562911	cent. about
\$ 1338.19	Ans.				above par,
				17389	Ans.

(3)			(4)		
	4000			1600	
	.08			.03	
	320.00			48.00	
	4000			1600	
				£	
	4320		3)	1648	(549
	40			15	
	9) 172800			14	
				12	
	Ans. \$ 19,200				
				28	
				27	
				1	or £ ½
				20	
				20	(6 s.
				18	
				2	or ½ s.
				12	
				24	(8 d.
				24	

(5)			(6)		
rupees.	annas.	pice.			
1835	12	3			
			12)	3.0 (.25	
				24	
				60	
				60	
				annas.	
			16)	12.25 (.765	
				112	
				105	
				96	
				90	
				80	

1835.765					
.50					
917.88250					
Ans. \$ 917.88					

$$\begin{array}{r}
 \textcircled{6} \\
 8232 \\
 .04 \\
 \hline
 329.28 \\
 8232 \\
 \hline
 .75) 8561.28 \quad (11415.04 \\
 \underline{75} \quad \text{Ans. 11,415 rubles 4 ko-} \\
 106 \quad \quad \quad \text{[pecs.} \\
 \underline{75} \\
 311 \\
 \underline{300} \\
 112 \\
 \underline{75} \\
 378 \\
 \underline{375} \\
 300 \\
 \underline{300}
 \end{array}$$

Lesson 223.

$$\begin{array}{r}
 \text{s.} \quad \text{d.} \quad \text{£} \\
 4 \quad 2 \quad 1 \\
 12 \quad \quad 20 \\
 \hline
 48 \quad \quad 20 \\
 2 \quad \quad 12 \\
 \hline
 50 \text{ d.} \quad 240 \text{ d.} \\
 \\
 50 \quad 240 \\
 12 \quad 1 \\
 \hline
 10 \quad 240 \\
 5 \quad 8000 \\
 \hline
 600 \quad 6|00) \quad 19200|00 \\
 \text{Ans. } \$3200
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 .35 \\
 \underline{9000} \\
 3150.00 \\
 .04 \\
 \underline{12600} \\
 3150 \\
 \underline{3276} \\
 2700 \\
 \text{Ans. } \$576 \text{ gain.}
 \end{array}$$

(2)

s.	d.	£
4	2	1
12		20
<hr/>		<hr/>
48		20
2		12
<hr/>		<hr/>
50 d.		240 d.
		240
		1
		<hr/>
50		240
24		2
<hr/>		<hr/>
20		480
10		3
<hr/>		<hr/>
1200		1440
4		9000
<hr/>		<hr/>
4800	4800) 12960000	\$ 2700
	9600	[Ans.]
	<hr/>	
	33600	
	33600	
	<hr/>	
	00	

(4)

By analysis.

£	s.	d.
1	4	2
20	12	
20	48	
12	2	
240 d.	50 d.	

50 d. value of 1 rix dollar.

5.25 fr. value of 1 rix dollar.

 $\frac{5}{8}$ or $\frac{1}{8}$ scudo; value of 1 d. $\frac{1}{5}$ scudo; value of 1 fr. $\frac{5}{8}$ scudo; value of 50 d. or
[1 rix dollar. $\frac{5.25}{5}$ or 1.05 scudo; value of
[5.25 fr. or 1 rix dollar.

7500
50
—
48(375000(7812½ scudi by way
336 [of London.

7500
1.05
—
375
75

390
384
—

7875.00 scudi by way
[of Havre.

60
48
—

7875
7812½
—

120
96
—

Ans., he will save 62½ scudi by remit-
[ting by way of London.

 $\frac{2}{3}$ or $\frac{1}{2}$

(5)

By analysis.

5000
.01
—

5000
50
—

\$4950 in Philadelphia will pay \$5000
.02 [in Baltimore.

4950
99
—

\$4851 in Boston will pay \$4950 in
Philadelphia, or \$5000 in
Baltimore or Charleston.

5000
4851
—

Ans. \$149

WEIGHTS AND MEASURES.

Lesson 225.

(1)

$$\begin{array}{r}
 7000 \\
 .06 \\
 \hline
 1.08 \quad 420.00 \\
 7000 \quad 184.80 \\
 \hline
 7560.00 \quad 7560) 6048.00 \quad \text{\$} \\
 \quad \quad \quad 60480 \quad \text{Ans.}
 \end{array}$$

(2)

$$\begin{array}{r}
 1076.4414 \\
 10000 \\
 \hline
 27225) 10764414.0000 \quad \begin{array}{l} 40 \\ 39538 \end{array} \quad \begin{array}{l} 4 \\ 988 \end{array} \quad (247 \text{ A.} \\
 \quad 81675 \quad \quad 360 \quad \quad 8 \\
 \hline
 \quad 259691 \quad \quad 353 \quad 18 \\
 \quad 245025 \quad \quad 320 \quad 16 \\
 \hline
 \quad 146664 \quad \quad 338 \quad 28 \\
 \quad 136125 \quad \quad 320 \quad 28 \\
 \hline
 \quad 105390 \quad \quad 18 \text{ sq. rods.} \\
 \quad 81675 \\
 \hline
 \quad 237150 \\
 \quad 217800 \\
 \hline
 19350 \text{ sq. ft.}
 \end{array}$$

(3)

$$\begin{array}{r}
 1 \text{ real.} \\
 \text{or } \$1.2\frac{1}{2} \\
 1.59\frac{1}{2} \text{ fanega.} \quad \text{or } \$1.25 \\
 \quad 10 \\
 \hline
 \$1.250 \text{ a fanega.} \\
 \quad 1.25 \\
 \quad 650 \\
 \hline
 \quad 625 \\
 \quad 750 \\
 \hline
 812500 \\
 \text{(Carried over.)}
 \end{array}$$

(Brought over.)

$$\begin{array}{r}
 \begin{array}{r}
 1.599) 812.500 \text{ (} \\
 \underline{7995} \\
 13000 \\
 \underline{12792} \\
 2080 \\
 \underline{1599} \\
 4810 \\
 \underline{4797} \\
 13
 \end{array}
 \quad
 \begin{array}{r}
 650 \\
 \hline
 508.13 \text{ (} \\
 \underline{4550} \\
 5313 \\
 \underline{5200} \\
 1130 \\
 \underline{650} \\
 4800 \\
 \underline{4550} \\
 2500 \\
 \underline{2600}
 \end{array}
 \end{array}$$

\$.78174 nearly. Ans.

(4)

$$\begin{array}{r}
 4.37 \\
 \underline{500} \\
 2185.00
 \end{array}
 \quad
 \begin{array}{r}
 2185) 1311.0 \text{ (} \\
 \underline{13110}
 \end{array}$$

\$.60 Ans.

(5)

$$\begin{array}{r}
 \begin{array}{r}
 12 \\
 \underline{3} \\
 36
 \end{array}
 \quad
 \begin{array}{r}
 22.578 \text{ in.} \\
 \underline{575} \\
 112890 \\
 \underline{158046} \\
 112890 \\
 \underline{12982350} \\
 108 \\
 \underline{218} \\
 216 \\
 \underline{223} \\
 216 \\
 \underline{75} \\
 72 \\
 \underline{3}
 \end{array}
 \end{array}$$

(360.62 about, Ans.

(6)

$$\begin{array}{r}
 105 \\
 12 \\
 \hline
 210 \\
 105 \\
 \hline
 1260 \text{ wine gals.} \\
 231 \\
 \hline
 126 \\
 378 \\
 252 \\
 \hline
 277.274) 291060.000 (1049.72 \\
 \underline{277274} \qquad \qquad .90 \\
 1378600 \qquad \qquad 944.7480 \\
 1109096 \qquad \qquad \hline
 2695040 \qquad \$944.75 \text{ Ans.} \\
 2495466 \\
 \hline
 1995740 \\
 1940918 \\
 \hline
 548220 \\
 554548
 \end{array}$$

s. d.
4 6
or 4.5 s.
2|0|4.5
£.225
4
\$.900

(7)

$$\begin{array}{r}
 34.24 \\
 4 \\
 \hline
 136.96 \\
 25 \\
 \hline
 68480 \\
 27392 \\
 \hline
 3424.00 \text{ Ans.}
 \end{array}$$

(8)

$$\begin{array}{r}
 1.08 \\
 9000 \\
 \hline
 \text{Ans. } 9,720.00
 \end{array}$$

(9)

$$\begin{array}{r}
 1.5594 \\
 5000 \\
 \hline
 \text{Ans. } 7,797.0000
 \end{array}$$

(10)

$$\begin{array}{r}
 840 \\
 .45 \\
 \hline
 420 \\
 168 \\
 100 \\
 \hline
 16800 \quad 16800) 378.00 (.0225 \text{ Ans.} \\
 \underline{336} \quad \quad \quad 33600 \\
 42000 \\
 \hline
 33600 \\
 \hline
 84000 \\
 84000
 \end{array}$$

THE END.

